



United States  
Department of  
Agriculture



Natural  
Resources  
Conservation  
Service

In cooperation with  
United States Department  
of the Interior, Bureau of Land  
Management,  
and the  
Utah Agricultural  
Experiment Station, the  
Utah Soil Conservation  
Commission, and the  
Utah Association of  
Conservation Districts

# Soil Survey of Grand Staircase- Escalante National Monument Area, Parts of Kane and Garfield Counties, Utah





# How To Use This Soil Survey

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The information provided in this publication can be useful in planning the use and management of small areas. The text includes descriptions of detailed soil map units and provides an explanation of the information presented in the tables. The publication also includes a glossary of terms used in the text and tables and a list of references.

Bookmarks and links in the publication allow the user to navigate from one part of the text to another. Maps showing soil lines and map unit symbols can be accessed for a particular area of interest through the Web Soil Survey of the Natural Resources Conservation Service, accessible at <http://websoilsurvey.nrcs.usda.gov/app/>. The symbols on the map represent the detailed soil map units in the area. These map units are listed in the bookmarks panel of the text. Information about the map units can be accessed by clicking on the appropriate bookmark.

The bookmarks panel corresponds to the Contents and allows the user to navigate easily throughout the book.

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This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 2003. Soil names and descriptions were approved in 2003. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2003. This survey was made by the Natural Resources Conservation Service in cooperation with the United States Department of the Interior Bureau of Land Management and the Utah Agricultural Experiment Station. It is part of the technical assistance furnished to the Upper Sevier Association of Conservation Districts, Kane County Association of Conservation Districts, and Canyonlands Association of Conservation Districts.

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**Cover: From the upper left corner, moving clockwise: Circle Cliffs, The Blues, Bryce Canyon National Park, and Fifty-Mile Mountain.**

*Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is <http://www.nrcs.usda.gov>.*

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# Foreword

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This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders and home buyers can use the survey to plan land use, select sites for construction and identify special practices needed to ensure proper performance. Conservationists, teachers, students and specialists in recreation, wildlife management, waste disposal and pollution control can use the survey to help them understand, protect and enhance the environment.

Various land use regulations of Federal, State and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Sylvia A. Gillen  
State Conservationist  
Natural Resources Conservation Service



# Soil Survey of Grand Staircase-Escalante National Monument Area, Parts of Kane and Garfield Counties, Utah

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United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with  
United States Department of the Interior, Bureau of Land Management, and the Utah Agricultural Experiment Station, the Utah Soil Conservation Commission, and the Utah Association of Conservation Districts

This survey area is in the south central part of Utah (fig. 1). It has a total area of 1,894,373 acres, or about 2,960 square miles. Elevation ranges from 4,000 feet near Lake Powell to 9,280 feet near Canaan Peak. No towns fall within the survey area. The towns of Escalante, Kanab, Boulder, Tropic, Cannonville, and Henrieville are located just outside of the survey area.

US Route 89 and State Highway 12 run east and west through the survey area. They are the main roadways through the area. Other major Bureau of Land Management roads located in the survey area are the Hole-in-the-Rock, Burr Trail, Cottonwood, and Skutumpah roads.

The survey is bordered by Capitol Reef National Park to the east, Glen Canyon National Recreational Area to the Southeast, Bryce Canyon National Park to the Northwest, and Dixie National Forest to the North. This soil survey overlaps and updates portions of the Panguitch Area, Utah, survey published in 1984.

## How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location; and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock.

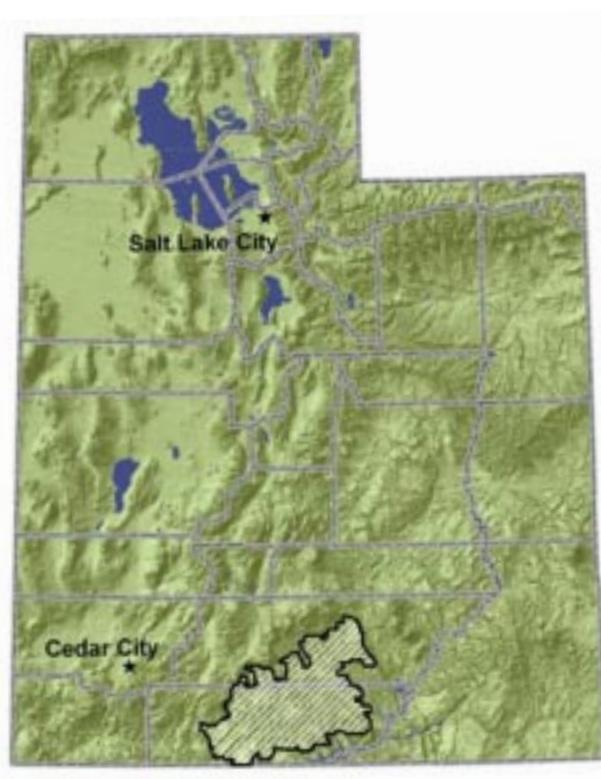


Figure 1.—Location of the Grand Staircase-Escalante National Monument Soil Survey area in Utah.

They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the

unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are arranged in an orderly pattern related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the

same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads and rivers, all of which help in locating boundaries accurately.

The descriptions, names and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences result from a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

# Climate

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Victor Parslow, soil scientist, Richfield, Utah, prepared this section from NRCS National Water and Climate Center data (<http://www.wcc.nrcs.usda.gov>; verified 2005).

Climate tables are created from climate stations at Escalante, Kanab, and Tropic, Utah. Thunderstorm days, relative humidity, percentage of sunshine, and wind information are estimated from First Order station, Grand Junction, Colorado.

Table 1 gives data on temperature and precipitation for the survey area as recorded at these three stations in the period from 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperatures at Escalante, Kanab, and Tropic are 30.4, 37.2, and 29.5 degrees F, respectively. The average daily minimum temperatures in winter are 17.2, 24.1, and 16.4 degrees. The lowest temperatures on record were -22 at Escalante on January 22, 1937; -20 at Kanab on January 22, 1937; and -18 at Tropic on December 24, 1990.

In summer, the average temperatures at Escalante, Kanab, and Tropic are 69.4, 72.8, and 65.4 degrees, respectively. The average daily maximum temperatures in summer are 87.0, 89.9, and 82.1 degrees. The highest recorded temperatures were 103 at Escalante on June 24, 1994; 108 at Kanab on July 5, 1985; and 101 at Tropic on June 14, 1953.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 10.04 inches at Escalante, 13.31 inches at Kanab, and 12.21 inches at Tropic. Of this, 5.68, 5.46, and 6.35 inches at Escalante, Kanab, and Tropic respectively, or an average of about 50 percent, usually falls in May through October. The growing season for most crops falls within this period. Precipitation in this soil survey area ranges from about 6 inches in the southeastern part of the area near the Glen Canyon National Recreation Area to more than 16 inches in the higher elevations in the northwestern part of the area near Bryce Canyon National Park. The heaviest 1-day rainfalls during the period of record were 4.4 inches in Escalante on August 31, 1921; 2.81 inches at Kanab on September 9, 1997; and 2.25 inches in Tropic on September 23, 1967. Thunderstorms occur on about 36 days each year, and most occur in late July, August, and September.

The average seasonal snowfall is about 26.1 inches at Escalante, 22.4 inches at Kanab, and 30.7 inches at Tropic. The greatest snow depths at any one time during the period of record were 22 inches at Escalante on January 29, 1979; 24 inches at Kanab on December 31, 1936; and 26 inches at Tropic on January 17, 1979. On average, 29 days of the year have at least 1 inch of snow on the ground at Escalante, 14 days at Kanab, and 20 days at Tropic. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 36 percent. Humidity is higher at night, and the average at dawn is about 61 percent. The sun shines 79 percent of the time possible in summer and 62 percent in winter. The prevailing wind is from the west, although wind direction is quite variable over this region of complex terrain. Average wind speed is highest, about 10 miles per hour, in April through July.



## Detailed Soil Map Units

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The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Hillburn very channery loam, 10 to 70 percent slopes, is a phase of the Hillburn series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Daklos-Catahoula complex, 2 to 30 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example. Table 4 gives the acreage and proportionate extent of each

map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

## Map Unit Descriptions

### 5001—Mido loamy fine sand, 2 to 15 percent slopes

#### Map Unit Setting

*Elevation:* 5,000 to 5,600 feet (1,524 to 1,707 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset and Seep Flats.

*Geology:* Entrada Sandstone (Je)

#### Map Unit Composition

Mido and similar soils: 85 percent

Minor components: 15 percent

#### Component Descriptions

##### Mido soils

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 15 percent

*Surface fragments:* About 1 percent gravel

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 5.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberry, leaf globemallow, sand buckwheat, sand sagebrush

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 3 inches; loamy fine sand

C1—3 to 46 inches; loamy fine sand

C2—46 to 60 inches; fine sand

#### Minor Components

##### Dune land

*Composition:* About 5 percent

*Landform:* Structural benches, dunes

##### Mido family and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

##### Earlweed and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Drainage class:* Somewhat excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

### 5002—Dune land

#### Map Unit Setting

*Elevation:* 5,000 to 5,600 feet (1,524 to 1,707 meters)

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset Flat, Seep Flat, and Red Breaks.

*Geology:* Navajo Sandstone (Jn); Entrada Sandstone (Je)

#### Map Unit Composition

Dune land: 90 percent

Minor components: 10 percent

#### Component Descriptions

##### Dune land

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 25 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Land capability subclass (nonirrigated):* 8

### Minor Components

Entrada Sandstone Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

Mido and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

## 5003—Milok, cool-Barx, dry complex, 1 to 5 percent slopes

### Map Unit Setting

*Elevation:* 5,000 to 6,000 feet (1,524 to 1,829 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset and Seep Flats, and south of the town of Cannonville.

*Geology:* Entrada Sandstone (Je); Carmel Formation, Winsor Member (Jcw)

### Map Unit Composition

Milok, cool and similar soils: 50 percent

Barx, dry and similar soils: 40 percent

Minor components: 10 percent

### Component Descriptions

#### Milok, cool soils

*Landform:* Alluvial flats on structural benches

*Parent material:* Eolian sand, mixed alluvium

*Slope:* 1 to 5 percent

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 6.7 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat

*Land capability subclass (nonirrigated):* 6e

### Typical Profile:

A—0 to 2 inches; fine sandy loam

Bw—2 to 8 inches; fine sandy loam

Bk1—8 to 23 inches; fine sandy loam

Bk2—23 to 38 inches; sandy loam

Bk3—38 to 60 inches; sandy loam

### Barx, dry soils

*Landform:* Alluvial flats

*Parent material:* Reworked eolian material, alluvium

*Slope:* 1 to 5 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.7 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate maximum:* About 40 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat

*Land capability subclass (nonirrigated):* 6e

### Typical Profile:

A1—0 to 2 inches; fine sandy loam

A2—2 to 9 inches; sandy loam

AB—9 to 19 inches; sandy loam

Bt—19 to 32 inches; sandy clay loam

Btk—32 to 56 inches; sandy clay loam

Bk—56 to 72 inches; sandy loam

### Minor Components

Yarts and similar soils

*Composition:* About 5 percent

*Landform:* Plains on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Ustic Torrifluvents and similar soils

*Composition:* About 3 percent

*Landform:* Alluvial flats

*Drainage class:* Well drained

*Ecological site:* Loamy Bottom (Basin Big Sagebrush)

Mido and similar soils

*Composition:* About 2 percent  
*Landform:* Dunes on structural benches  
*Drainage class:* Excessively drained  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)

## 5004—Rock outcrop (Navajo Sandstone)

### Map Unit Setting

*Elevation:* 5,250 to 7,870 feet (1,600 to 2,400 meters)  
*Note:* Located between the towns of Escalante and Boulder, east of the Hole-in-the-Rock Road, west of the Cockscomb, and south of the Skutumpah Road.  
*Geology:* Navajo Sandstone (Jn); with very minor amounts of Page Sandstone and Judd Hollow Tongue of the Carmel Formation (Jp)

### Map Unit Composition

Navajo Sandstone Rock outcrop: 90 percent  
 Minor components: 10 percent

### Component Descriptions

#### Navajo Sandstone Rock outcrop

*Landform:* Escarpments, slickrock on structural benches  
*Slope:* 30 to 100 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

#### Minor Components

Psamments and similar soils  
*Composition:* About 10 percent  
*Landform:* Hillslopes on escarpments  
*Drainage class:* Excessively drained

## 5006—Milok fine sandy loam, cool, 2 to 8 percent slopes

### Map Unit Setting

*Elevation:* 5,000 to 5,900 feet (1,524 to 1,799 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset and Seep Flats.

*Geology:* Carmel Formation, Paria River Member (Jcp); Entrada Sandstone (Je)

### Map Unit Composition

Milok, cool, and similar soils: 85 percent  
 Minor components: 15 percent

### Component Descriptions

#### Milok, cool, soils

*Landform:* Alluvial flats on structural benches  
*Parent material:* Eolian sand, mixed alluvium  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.2 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 6e

#### Typical Profile:

A—0 to 8 inches; fine sandy loam  
 Bw—8 to 18 inches; fine sandy loam  
 Bk1—18 to 27 inches; fine sandy loam  
 Bk2—27 to 60 inches; fine sandy loam

#### Minor Components

Mivida and similar soils

*Composition:* About 5 percent  
*Landform:* Plains on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Yarts and similar soils

*Composition:* About 5 percent  
*Landform:* Plains on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Barx, dry and similar soils

*Composition:* About 3 percent

*Landform:* Alluvial flats

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Mido and similar soils

*Composition:* About 2 percent

*Landform:* Dunes on structural benches

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

### **5007—Rock outcrop (Navajo Sandstone)-Nalcase complex, 2 to 30 percent slopes**

#### **Map Unit Setting**

*Elevation:* 5,200 to 7,500 feet (1,585 to 2,287 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, around the town of Boulder, east of the town of Escalante, and on or near the Cockscomb.

*Geology:* Navajo Sandstone (Jn); with very minor amounts of Kayenta Formation, main body (Jk); Page Sandstone and Judd Hollow Tongue of the Carmel Formation (Jp)

#### **Map Unit Composition**

Navajo Sandstone Rock outcrop: 65 percent

Nalcase and similar soils: 25 percent

Minor components: 10 percent

#### **Component Descriptions**

##### **Navajo Sandstone Rock outcrop**

*Landform:* Slickrock on structural benches, escarpments

*Slope:* 10 to 70 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

##### **Nalcase soils**

*Landform:* Sand sheets on structural benches

*Parent material:* Eolian sand, residuum, alluvium

*Slope:* 2 to 30 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 0.5 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Sand (Cutler Mormon tea)

*Potential native vegetation:* Cutler Mormon tea, Indian ricegrass, Bigelow sagebrush, Havard's oak, mesa dropseed, sand dropseed, sand sagebrush, shrub live oak, spike dropseed

*Land capability subclass (nonirrigated):* 7s

#### *Typical Profile:*

A—0 to 4 inches; fine sand

C—4 to 8 inches; fine sand

R—8 inches; Navajo Sandstone bedrock

#### **Minor Components**

Bispen and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

Santrick and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

### **5008—Simel complex, 2 to 60 percent slopes**

#### **Map Unit Setting**

*Elevation:* 5,000 to 6,200 feet (1,524 to 1,890 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset and Seep Flats and around the town of Cannonville.

*Geology:* Carmel Formation, Paria River Member (Jcp); Page Sandstone and Judd Hollow Tongue of the Carmel Formation (Jp); Carmel Formation, Winsor member (Jcw); Entrada Sandstone (Je)

### Map Unit Composition

Simel and similar soils: 55 percent  
 Simel, steep and similar soils: 30 percent  
 Minor components: 15 percent

### Component Descriptions

#### Simel soils

*Landform:* Structural benches  
*Parent material:* Alluvium, residuum  
*Slope:* 2 to 8 percent  
*Surface fragments:* About 10 percent channers  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 1.1 inches (very low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)  
*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 2 inches; sandy loam  
 C—2 to 7 inches; silty clay loam  
 Cr—7 to 12 inches; weathered bedrock  
 R—12 inches; bedrock

#### Simel, steep soils

*Landform:* Structural benches  
*Parent material:* Alluvium, residuum  
*Slope:* 8 to 60 percent  
*Surface fragments:* About 10 percent channers  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 0.5 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

C—0 to 3 inches; silty clay loam  
 Cr—3 to 8 inches; weathered bedrock  
 R—8 inches; bedrock

### Minor Components

Carmel Formation Rock outcrop  
*Composition:* About 8 percent  
*Landform:* Structural benches  
 Wayneco, dry and similar soils  
*Composition:* About 7 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Loam (Torrey Mormon tea)

## 5009—Wayneco sandy loam, dry, 2 to 15 percent slopes

### Map Unit Setting

*Elevation:* 5,000 to 5,600 feet (1,524 to 1,707 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset and Seep Flats.  
*Geology:* Page Sandstone and Judd Hollow Tongue of the Carmel Formation (Jp); Carmel Formation, Paria River Member (Jcp); Carmel Formation, Winsor Member (Jcw)

### Map Unit Composition

Wayneco, dry and similar soils: 85 percent

Minor components: 15 percent

### Component Descriptions

#### Wayneco, dry soils

*Landform:* Structural benches

*Parent material:* Siltstone and sandstone residuum

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Torrey Mormon tea)

*Potential native vegetation:* Torrey Mormon tea, galleta, Indian ricegrass, Brenda's yellow cryptantha, Mexican cliffrose, Utah juniper, broom snakeweed, grassy rockgoldenrod, green Mormon tea, narrowleaf yucca, needleandthread

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 5 inches; sandy loam

Bk—5 to 19 inches; channery loam

R—19 inches; bedrock

#### Minor Components

Simel and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)

Carmel Formation Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

Loamy-skeletal Lithic Ustic Haplocalcids and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

### 5010—Retsabal-Lemrac complex, 2 to 60 percent slopes

#### Map Unit Setting

*Elevation:* 5,000 to 6,000 feet (1,524 to 1,829 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset and Seep Flats and south of the town of Cannonville along the Cottonwood Road near Kodachrome Basin State Park.

*Geology:* Carmel Formation, Winsor Member (Jcw); Carmel Formation, Paria River Member (Jcp)

#### Map Unit Composition

Retsabal and similar soils: 50 percent

Lemrac and similar soils: 40 percent

Minor components: 10 percent

#### Component Descriptions

##### Retsabal soils

*Landform:* Small knolls on structural benches

*Parent material:* Gypsum bedrock residuum

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* About 80 percent

*Salinity maximum:* About 10 mmhos/cm (moderately saline)

*Sodium adsorption ratio maximum:* About 2 (nonsodic)

*Ecological site:* Semidesert Shallow Gypsum (Mormon tea)

*Potential native vegetation:* Indian ricegrass, Torrey Mormon tea, broom snakeweed, Brenda's yellow cryptantha, Fremont's mahonia, Mexican cliffrose, Utah juniper, bottlebrush squirreltail, crispleaf buckwheat, galleta, green Mormon tea, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 1 inch; very fine sandy loam  
 Cy1—1 to 3 inches; very fine sandy loam  
 Cy2—3 to 15 inches; loam  
 Cr—15 inches; weathered bedrock

**Lemrac soils**

*Landform:* Small knolls on structural benches  
*Parent material:* Gypsum bedrock residuum  
*Slope:* 15 to 60 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 5.8 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* About 80 percent  
*Salinity maximum:* About 8 mmhos/cm (slightly saline)  
*Sodium adsorption ratio maximum:* About 2 (slightly sodic)  
*Ecological site:* Semidesert Shallow Gypsum (Mormon tea)  
*Potential native vegetation:* Indian ricegrass, Torrey Mormon tea, broom snakeweed, Brenda's yellow cryptantha, Fremont's mahonia, Mexican cliffrose, Utah juniper, bottlebrush squirreltail, crispleaf buckwheat, galleta, green Mormon tea, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 5s

*Typical Profile:*

A—0 to 1 inch; very fine sandy loam  
 Cy1—1 to 19 inches; loam  
 Cy2—19 to 34 inches; very fine sandy loam  
 Cr—34 inches; weathered bedrock

**Minor Components**

Carmel Formation Gypsum Badlands  
*Composition:* About 10 percent  
*Landform:* Structural benches

### **5011—Badland (Carmel Formation)-Rizno, cool-Nonip complex, 5 to 25 percent slopes**

**Map Unit Setting**

*Elevation:* 5,000 to 5,900 feet (1,524 to 1,799 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 54 degrees F (7.0 to 12.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset and Seep Flats and south of the town of Cannonville.

*Geology:* Carmel Formation, Winsor Member (Jcw); Carmel Formation, Paria River Member (Jcp)

**Map Unit Composition**

Carmel Formation Badland: 35 percent  
 Rizno, cool and similar soils: 30 percent  
 Nonip and similar soils: 20 percent  
 Minor components: 15 percent

**Component Descriptions****Carmel Formation Badland**

*Landform:* Hills on structural benches  
*Parent material:* Carmel formation  
*Slope:* 25 to 70 percent  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Salinity maximum:* About 10 mmhos/cm (moderately saline)  
*Land capability subclass (nonirrigated):* 8

**Rizno, cool soils**

*Landform:* Structural benches  
*Parent material:* Siltstone and sandstone residuum  
*Slope:* 5 to 25 percent  
*Surface fragments:* About 40 percent channers  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.0 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:*  
 Common trees: juniper, twoneedle pinyon  
 Other plants: Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 3 inches; channery loam  
 C1—3 to 6 inches; fine sandy loam

C2—6 to 9 inches; parachannery fine sandy loam  
R—9 inches; bedrock

### Nonip soils

*Landform:* Dissected hillslopes on structural benches, structural benches

*Parent material:* Siltstone, limestone, and shale residuum

*Slope:* 5 to 25 percent

*Surface fragments:* About 80 percent channers

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.4 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Galleta-Utah Juniper)

*Potential native vegetation:* Utah juniper, Indian ricegrass, blue grama, Mexican cliffrose, broom snakeweed, galleta, gooseberryleaf globemallow, needleandthread

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

C—0 to 5 inches; extremely channery clay loam

R—5 inches; bedrock

### Minor Components

Retsabal and similar soils

*Composition:* About 5 percent

*Landform:* Small knolls on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Gypsum (Mormon tea)

Lemrac and similar soils

*Composition:* About 5 percent

*Landform:* Small knolls on structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Gypsum (Mormon tea)

Carmel Formation Gypsum Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

## 5012—Santrick-Nalcase-Bispen complex, 2 to 30 percent slopes

### Map Unit Setting

*Elevation:* 5,700 to 6,700 feet (1,738 to 2,043 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Escalante, around the town of Boulder and southeast of the town of Escalante, along the Hole-in-the-Rock Road.

*Geology:* Navajo Sandstone (Jn)

### Map Unit Composition

Santrick and similar soils: 45 percent

Nalcase and similar soils: 30 percent

Bispen and similar soils: 20 percent

Minor components: 5 percent

### Component Descriptions

#### Santrick soils

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand, residuum

*Slope:* 2 to 30 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 2.8 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Indian ricegrass, needleandthread, Wyoming big sagebrush, fourwing saltbush, galleta, green Mormon tea

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; loamy fine sand

C1—4 to 12 inches; loamy fine sand

C2—12 to 22 inches; loamy fine sand

C3—22 to 28 inches; loamy fine sand

R—28 inches; bedrock

**Nalcase soils**

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand, residuum, alluvium  
*Slope:* 2 to 30 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 0.4 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sand (Cutler Mormon tea)  
*Potential native vegetation:* Cutler Mormon tea, Indian ricegrass, Bigelow sagebrush, Havard's oak, mesa dropseed, sand dropseed, sand sagebrush, shrub live oak, spike dropseed  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 1 inch; fine sand  
 C—1 to 6 inches; fine sand  
 R—6 inches; bedrock

**Bispen soils**

*Landform:* Dunes on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 30 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 3.6 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 6 inches; fine sand

C—6 to 51 inches; fine sand

R—51 inches; bedrock

**Minor Components**

Mesapun and similar soils

*Composition:* About 3 percent

*Landform:* Dunes on structural benches

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

Navajo Sandstone Rock outcrop

*Composition:* About 2 percent

*Landform:* Slickrock on structural benches

**5013—Mido-Yarts complex, 2 to 15 percent slopes****Map Unit Setting**

*Elevation:* 4,300 to 5,900 feet (1,311 to 1,799 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset and Seep Flats and along Highway 89, near the Cockscomb.

*Geology:* Upper Carmel Formation (Jcu); Entrada Sandstone (Je)

**Map Unit Composition**

Mido and similar soils: 60 percent

Yarts and similar soils: 30 percent

Minor components: 10 percent

**Component Descriptions****Mido soils**

*Landform:* Dunes on structural benches, sand sheets

*Parent material:* Eolian sand

*Slope:* 4 to 15 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush  
*Land capability subclass (nonirrigated):* 7s

**Typical Profile:**

A—0 to 4 inches; fine sand  
 C—4 to 60 inches; fine sand

**Yarts soils**

*Landform:* Interdunes on structural benches  
*Parent material:* Eolian sand, alluvium  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 4.8 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 5c

**Typical Profile:**

A—0 to 5 inches; loamy fine sand  
 C—5 to 60 inches; fine sandy loam

**Minor Components****Dune land**

*Composition:* About 5 percent  
*Landform:* Structural benches, dunes  
*Drainage class:* Excessively drained

**Earlweed and similar soils**

*Composition:* About 5 percent  
*Landform:* Dunes on structural benches  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)

**5015—Mespun fine sand, 2 to 15 percent slopes****Map Unit Setting**

*Elevation:* 5,000 to 5,990 feet (1,524 to 1,826 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante and around the town of Boulder.

*Geology:* Navajo Sandstone (Jn)

**Map Unit Composition**

Mespun and similar soils: 90 percent

Minor components: 10 percent

**Component Descriptions****Mespun soils**

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 15 percent  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush  
*Land capability subclass (nonirrigated):* 5c

**Typical Profile:**

A—0 to 20 inches; fine sand  
 C1—20 to 40 inches; fine sand  
 C2—40 to 60 inches; fine sand

**Minor Components****Bispen and similar soils**

*Composition:* About 5 percent  
*Landform:* Dunes on structural benches  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)

**Santrick and similar soils**

*Composition:* About 4 percent  
*Landform:* Dunes on structural benches  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Excessively drained  
*Ecological site:* Semidesert Sandy Loam  
 (Wyoming Big Sagebrush)

Dune land

*Composition:* About 1 percent  
*Landform:* Dunes on structural benches

## 5017—Skos, dry-Mido-Arches, dry complex, 2 to 15 percent slopes

### Map Unit Setting

*Elevation:* 5,300 to 6,700 feet (1,616 to 2,043 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset Flat, Seep Flat, and Red Breaks and around the town of Boulder.

*Geology:* Page Sandstone and Judd Hollow Tongue of the Carmel Formation (Jp); Carmel Formation (Jc); Carmel Formation, Paria River Member (Jcp)

### Map Unit Composition

Skos, dry and similar soils: 40 percent  
 Mido and similar soils: 35 percent  
 Arches, dry and similar soils: 15 percent  
 Minor components: 10 percent

### Component Descriptions

#### Skos, dry soils

*Landform:* Structural benches  
*Parent material:* Siltstone and sandstone residuum  
*Slope:* 4 to 15 percent  
*Surface fragments:* About 50 percent cobbles  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.1 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)  
*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon

tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 6 inches; gravelly loamy fine sand  
 C—6 to 13 inches; very channery sandy clay loam  
 R—13 inches; bedrock

#### Mido soils

*Landform:* Dunes on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 15 percent  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 15 inches; fine sand  
 C1—15 to 30 inches; fine sand  
 C2—30 to 45 inches; fine sand  
 C3—45 to 60 inches; fine sand

#### Arches, dry soils

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 15 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 0.7 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 8 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)  
*Potential native vegetation:* Bigelow sagebrush, Utah juniper, roundleaf buffaloberry, Indian ricegrass,

Mexican cliffrose, Torrey Mormon tea, Wright birdbeak, broom snakeweed, galleta, rubber rabbitbrush, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; loamy fine sand

C—4 to 9 inches; fine sand

R—9 inches; bedrock

**Minor Components**

Carmel Formation Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

Page Sandstone, Carmel Formation Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

**5018—Skos channery loam, dry, 5 to 30 percent slopes**

**Map Unit Setting**

*Elevation:* 5,000 to 6,700 feet (1,524 to 2,043 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset Flat, Seep Flat, and Red Breaks.

*Geology:* Carmel Formation, Paria River Member (Jcp); Page Sandstone and Judd Hollow Tongue of Carmel Formation (Jp)

**Map Unit Composition**

Skos, dry and similar soils: 85 percent

Minor components: 15 percent

**Component Descriptions**

**Skos, dry soils**

*Landform:* Hillslopes on structural benches

*Parent material:* Siltstone and sandstone residuum

*Slope:* 5 to 30 percent

*Surface fragments:* About 70 percent channers

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.8 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Shale (Utah

Juniper-Pinyon)

*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 2 inches; channery loam

C1—2 to 4 inches; very channery loam

C2—4 to 8 inches; very channery loam

R—8 inches; bedrock

**Minor Components**

Wayneco, dry and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Loam (Torrey Mormon tea)

Loamy-skeletal Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

Carmel Formation Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

**5019—Skos, dry-Rock outcrop (Carmel Formation)-Arches, dry complex, 15 to 60 percent slopes**

**Map Unit Setting**

*Elevation:* 5,400 to 6,700 feet (1,646 to 2,043 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east and southeast of the town of Escalante, along the Hole-in-the-Rock Road, primarily on Tenmile Flat.

*Geology:* Page Sandstone and Judd Hollow Tongue of Carmel Formation (Jp); Carmel Formation, Paria

River Member (Jcp); Carmel Formation (Jc);  
Navajo Sandstone (Jn)

### Map Unit Composition

Skos, dry and similar soils: 45 percent  
Page Sandstone, Carmel Formation Rock outcrop: 30 percent  
Arches, dry and similar soils: 15 percent  
Minor components: 10 percent

### Component Descriptions

#### Skos, dry soils

*Landform:* Hillslopes on structural benches  
*Parent material:* Siltstone and sandstone residuum  
*Slope:* 15 to 60 percent  
*Surface fragments:* About 10 percent gravel, about 70 percent channers, about 10 percent flagstone  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.6 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)  
*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 2 inches; very channery loam  
C1—2 to 8 inches; very channery loam  
C2—8 to 18 inches; very channery loam  
R—18 inches; bedrock

#### Page Sandstone, Carmel Formation Rock outcrop

*Landform:* Escarpments and structural benches  
*Slope:* 30 to 60 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

#### Arches, dry soils

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand  
*Slope:* 15 to 40 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 1.1 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 8 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)

*Potential native vegetation:* Bigelow sagebrush, Utah juniper, roundleaf buffaloberry, Indian ricegrass, Mexican cliffrose, Torrey Mormon tea, Wright birdbeak, broom snakeweed, galleta, rubber rabbitbrush, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 3 inches; fine sand  
C1—3 to 10 inches; loamy fine sand  
C2—10 to 13 inches; loamy fine sand  
R—13 inches; bedrock

### Minor Components

Loamy-skeletal Ustic Torriorthents and similar soils

*Composition:* About 7 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained

Wayneco, dry and similar soils

*Composition:* About 3 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Loam (Torrey Mormon tea)

### 5020—Rock outcrop (Navajo Sandstone)-Mespun-Nalcase complex, 2 to 30 percent slopes

#### Map Unit Setting

*Elevation:* 4,800 to 6,500 feet (1,463 to 1,982 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, in the Egypt area, around the town of Boulder and near Highway 89 along the Cockscomb.

*Geology:* Navajo Sandstone (Jn)

### Map Unit Composition

Navajo Sandstone Rock outcrop: 40 percent

Nalcase and similar soils: 25 percent

Mespuen and similar soils: 25 percent

Minor components: 10 percent

### Component Descriptions

#### Navajo Sandstone Rock outcrop

*Landform:* Structural benches

*Slope:* 2 to 30 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Mespuen soils

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 30 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 5 inches; fine sand

C1—5 to 40 inches; fine sand

C2—40 to 60 inches; sand

#### Nalcase soils

*Landform:* Sand sheets on structural benches

*Parent material:* Eolian sand, residuum, alluvium

*Slope:* 2 to 15 percent

*Surface fragments:* About 10 percent gravel

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 0.8 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Sand (Cutler Mormon tea)

*Potential native vegetation:* Cutler Mormon tea, Indian ricegrass, Bigelow sagebrush, Havard's oak, mesa dropseed, sand dropseed, sand sagebrush, shrub live oak, spike dropseed

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 10 inches; sand

C—10 to 13 inches; sand

R—13 inches; bedrock

### Minor Components

Bispen and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

Santrick and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

## 5021—Milok, cool-Anasazi, cool complex, 2 to 8 percent slopes

### Map Unit Setting

*Elevation:* 5,800 to 6,200 feet (1,768 to 1,890 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located around the town of Escalante and southeast of the town of Escalante, along the Hole-in-the-Rock Road, west of Tenmile Flat.

*Geology:* Carmel Formation, Paria River Member (Jcp)

### Map Unit Composition

Milok, cool and similar soils: 70 percent  
 Anasazi, cool and similar soils: 20 percent  
 Minor components: 10 percent

### Component Descriptions

#### Milok, cool soils

*Landform:* Plains on structural benches  
*Parent material:* Mixed alluvium, eolian sand  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.2 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 6e

#### Typical Profile:

A—0 to 8 inches; fine sandy loam  
 Bw—8 to 16 inches; fine sandy loam  
 Bk1—16 to 30 inches; fine sandy loam  
 Bk2—30 to 38 inches; fine sandy loam  
 Bk3—38 to 60 inches; fine sandy loam

#### Anasazi, cool soils

*Landform:* Plains on structural benches  
*Parent material:* Mixed alluvium, eolian sand  
*Slope:* 2 to 8 percent  
*Surface fragments:* About 10 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 4.1 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass,

needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A1—0 to 3 inches; loam  
 A2—3 to 10 inches; loam  
 Bw—10 to 20 inches; loam  
 Bk—20 to 30 inches; gravelly fine sandy loam  
 R—30 inches; bedrock

### Minor Components

Yarts and similar soils

*Composition:* About 8 percent  
*Landform:* Plains on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Horsemountain family and similar soils

*Composition:* About 2 percent  
*Landform:* Fan remnants  
*Depth to restrictive feature:* 8 to 20 inches to petrocalcic  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Hardpan (Utah Juniper-Pinyon)

## 5023—Tsaya channery loam, 5 to 25 percent slopes

### Map Unit Setting

*Elevation:* 5,000 to 5,500 feet (1,524 to 1,677 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near Coyote Gulch and Cat Pasture.  
*Geology:* Carmel Formation, Paria River Member (Jcp); Carmel Formation, Winsor Member (Jcw); with minor amounts of Navajo Sandstone (Jn)

### Map Unit Composition

Tsaya and similar soils: 80 percent  
 Minor components: 20 percent

### Component Descriptions

#### Tsaya soils

*Landform:* Hillslopes on structural benches

*Parent material:* Slope alluvium, residuum  
*Slope:* 5 to 25 percent  
*Surface fragments:* About 5 percent cobbles, about 50 percent channers  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.9 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)  
*Potential native vegetation:* blackbrush, Cutler Mormon tea, galleta, Indian ricegrass  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 3 inches; channery loam  
 C1—3 to 6 inches; very channery loam  
 C2—6 to 9 inches; very channery loam  
 R—9 inches; bedrock

**Minor Components**

Carmel Formation Rock outcrop  
*Composition:* About 10 percent  
*Landform:* Structural benches  
 Loamy Lithic Torriorthents and similar soils  
*Composition:* About 6 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
 Needle and similar soils  
*Composition:* About 4 percent  
*Landform:* Sand sheets on structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)

**5025—Yarts sandy loam, 2 to 8 percent slopes****Map Unit Setting**

*Elevation:* 5,000 to 6,300 feet (1,524 to 1,921 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located around and southeast of the town of Escalante, along the Hole-in-the-Rock Road, near Seep Flat.

*Geology:* Carmel Formation, Winsor Member (Jcw); Entrada Sandstone (Je)

**Map Unit Composition**

Yarts and similar soils: 85 percent

Minor components: 15 percent

**Component Descriptions****Yarts soils**

*Landform:* Plains on structural benches

*Parent material:* Alluvium, eolian sand

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.0 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 10 inches; sandy loam  
 C—10 to 60 inches; fine sandy loam

**Minor Components**

Mikim and similar soils

*Composition:* About 10 percent

*Landform:* Plains and alluvial flats on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

Henrieville and similar soils

*Composition:* About 5 percent

*Landform:* Alluvial flats

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam  
(Wyoming Big Sagebrush)

### **5026—Rock outcrop (Entrada and Carmel Formation sandstone)**

#### **Map Unit Setting**

*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near Sooner Bench and Grand Bench. Also located south of the town of Cannonville along the Cockscomb and Skutumpah Road and along Highway 89 from the Cockscomb to Lake Powell.

*Geology:* Entrada Sandstone (Je); Carmel Formation (Jc); Dakota Formation (Kd)

#### **Map Unit Composition**

Entrada and Carmel Formation Rock outcrop: 95 percent

Minor components: 5 percent

#### **Component Descriptions**

##### **Entrada and Carmel Formation Rock outcrop**

*Slope:* 30 to 60 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

##### **Minor Components**

Arches, dry and similar soils

*Composition:* About 4 percent

*Landform:* Sand sheets on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)

Mido and similar soils

*Composition:* About 1 percent

*Landform:* Dunes on structural benches

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

### **5027—Badland (Tropic Formation Shale)-Cannonville-Rock outcrop (Dakota Formation) complex, 30 to 50 percent slopes**

#### **Map Unit Setting**

*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located south of the town of Escalante, down the Hole-in-the-Rock Road along Fiftymile Bench, around the town of Cannonville and southeast of the town of Cannonville along the Cockscomb.

*Geology:* Tropic Shale (Kt); with lesser amounts of Dakota Formation (Kd)

#### **Map Unit Composition**

Tropic Formation Shale Badland: 45 percent

Cannonville and similar soils: 30 percent

Dakota Formation Rock outcrop: 15 percent

Minor components: 10 percent

#### **Component Descriptions**

##### **Tropic Formation Shale Badland**

*Parent material:* Tropic shale

*Slope:* 30 to 70 percent

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Salinity maximum:* About 10 mmhos/cm (moderately saline)

*Land capability subclass (nonirrigated):* 8

##### **Cannonville soils**

*Landform:* Hillslopes

*Parent material:* Shale residuum

*Slope:* 30 to 50 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 7.5 percent (high)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 5 (slightly sodic)

*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)

*Potential native vegetation:* Indian ricegrass, galleta, roundleaf buffaloberry, shadscale, bottlebrush squirreltail, Utah juniper, black sagebrush, crispleaf buckwheat

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 7 inches; clay

Cr—7 inches; weathered bedrock

### **Dakota Formation Rock outcrop**

*Slope:* 30 to 60 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

### **Minor Components**

Cannonville family and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)

Entrada Sandstone Rock outcrop

*Composition:* About 5 percent

## **5028—Badland (Entrada Formation)**

### **Map Unit Setting**

*Elevation:* 4,800 to 5,800 feet (1,463 to 1,768 meters)

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near Buckaroo Flat.

*Geology:* Entrada Formation, Cannonville Member (Je)

### **Map Unit Composition**

Cannonville Member, Entrada Formation Badland: 95 percent

Minor components: 5 percent

### **Component Descriptions**

#### **Cannonville Member, Entrada Formation Badland**

*Parent material:* Entrada sandstone (Cannonville member)

*Slope:* 30 to 60 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

### **Minor Components**

Yarts and similar soils

*Composition:* About 3 percent

*Landform:* Alluvial fans

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Milok, cool and similar soils

*Composition:* About 2 percent

*Landform:* Plains on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

## **5029—Rock outcrop (Straight Cliffs Formation)-Atchee family, steep-Chilton family complex, 50 to 80 percent slopes**

### **Map Unit Setting**

*Elevation:* 5,400 to 6,800 feet (1,646 to 2,073 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located south of the town of Escalante, near Left Hand Collet Canyon, Fiftymile Bench, and along the Cockscomb.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Drip Tank Member (Ksd); Straight Cliffs Formation, Lower Member (Ksl)

### **Map Unit Composition**

Straight Cliffs Formation Rock outcrop: 40 percent

Atchee family, steep and similar soils: 30 percent

Chilton family and similar soils: 20 percent

Minor components: 10 percent

### **Component Descriptions**

#### **Straight Cliffs Formation Rock outcrop**

*Landform:* Cliffs on escarpments

*Slope:* 60 to 140 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Atchee family, steep soils**

*Landform:* Dissected ledges on escarpments, structural benches

*Parent material:* Colluvium, residuum, slope alluvium

*Slope:* 50 to 80 percent

*Surface fragments:* About 20 percent gravel, about 10 percent cobbles, about 20 percent channers, about 10 percent flagstones, about 15 percent stones, about 15 percent boulders

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.1 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 3 inches; very gravelly sandy loam

C1—3 to 12 inches; very flaggy sandy loam

C2—12 to 17 inches; very gravelly sandy loam

R—17 inches; bedrock

**Chilton family soils**

*Landform:* Ledges on escarpments

*Parent material:* Colluvium, residuum, slope alluvium

*Slope:* 50 to 80 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 10 percent stones, about 25 percent boulders

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 3.8 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Gravelly Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Indian ricegrass, fourwing saltbush, galleta, Torrey Mormon tea, blue grama, broom snakeweed, grassy rockgoldenrod, needleandthread, twoneedle pinyon

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A1—0 to 1 inch; very bouldery sandy loam

A2—1 to 4 inches; stony sandy loam

C—4 to 39 inches; very stony sandy loam

R—39 inches; bedrock

**Minor Components**

Catahoula family and similar soils

*Composition:* About 10 percent

*Landform:* Landslide deposits on escarpments

*Drainage class:* Well drained

*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)

**5030—Catahoula-Clapper, dry complex, 15 to 60 percent slopes****Map Unit Setting**

*Elevation:* 5,600 to 6,500 feet (1,707 to 1,982 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near Sooner Bench.

*Geology:* Tropic Shale (Kt); Straight Cliffs Formation, Lower Member (Ksl); Dakota Formation (Kd)

**Map Unit Composition**

Catahoula and similar soils: 60 percent

Clapper, dry and similar soils: 30 percent

Minor components: 10 percent

**Component Descriptions****Catahoula soils**

*Landform:* Landslide deposits on escarpments

*Parent material:* Colluvium, slope alluvium

*Slope:* 15 to 60 percent

*Surface fragments:* About 5 percent gravel, about 10 percent cobbles, about 10 percent stones, about 15 percent boulders

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.8 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Indian ricegrass, Utah juniper, galleta, green Mormon tea, roundleaf buffaloberry, Wyoming big sagebrush, broom snakeweed, needleandthread, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 5s

**Typical Profile:**

A—0 to 5 inches; very bouldery sandy loam  
 C1—5 to 26 inches; very bouldery loam  
 C2—26 to 49 inches; very bouldery loam  
 C3—49 to 60 inches; very bouldery loam

**Clapper, dry soils**

*Landform:* Hillslopes on landslides  
*Parent material:* Mixed alluvium  
*Slope:* 15 to 60 percent  
*Surface fragments:* About 5 percent gravel, about 5 percent cobbles, about 10 percent stones, about 1 percent boulders  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 5.5 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Indian ricegrass, Utah juniper, galleta, green Mormon tea, roundleaf buffaloberry, Wyoming big sagebrush, broom snakeweed, needleandthread, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 5s

**Typical Profile:**

A—0 to 5 inches; very stony sandy loam  
 Bw—5 to 13 inches; very stony loam  
 Bk1—13 to 20 inches; very cobbly loam  
 Bk2—20 to 38 inches; very cobbly loam  
 Bk3—38 to 60 inches; very cobbly loam

**Minor Components**

Tropic Shale Badland

*Composition:* About 10 percent  
*Landform:* Hillslopes

**5031—Moclom-Rock outcrop (Morrison Formation) complex, 2 to 15 percent slopes****Map Unit Setting**

*Elevation:* 5,200 to 6,200 feet (1,585 to 1,890 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located around the town of Escalante and southeast of the town of Escalante, along the Hole-in-the-Rock Road.  
*Geology:* Morrison Formation (Jm); with minor amounts of Entrada Sandstone (Je)

**Map Unit Composition**

Moclom and similar soils: 50 percent  
 Morrison Formation Rock outcrop: 30 percent  
 Minor components: 20 percent

**Component Descriptions****Moclom soils**

*Landform:* Structural benches  
*Parent material:* Residuum, alluvium  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 45 percent gravel  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 0.6 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 3 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

**Typical Profile:**

A—0 to 3 inches; gravelly sand

C—3 to 10 inches; sand  
R—10 inches; bedrock

### Morrison Formation Rock outcrop

*Landform:* Hillslopes on structural benches  
*Slope:* 2 to 30 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

### Minor Components

Cannonville family and similar soils

*Composition:* About 14 percent  
*Landform:* Hillslopes  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)

Rizno, cool and similar soils

*Composition:* About 6 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

## 5032—Remorris-Kenzo, steep-Rock outcrop (Morrison and Entrada Formations) complex, 30 to 60 percent slopes

### Map Unit Setting

*Elevation:* 5,200 to 6,000 feet (1,585 to 1,829 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 54 degrees F (7.0 to 12.0 degrees C)  
*Frost-free period:* 120 to 180 days  
*Note:* Located around the town of Escalante and south of the town of Escalante along Fiftymile Bench.  
*Geology:* Morrison Formation (Jm); Entrada Sandstone (Je); with minor amounts of Dakota Formation (Kd)

### Map Unit Composition

Remorris and similar soils: 40 percent  
Kenzo, steep and similar soils: 30 percent  
Morrison and Entrada Formation Rock outcrop: 25 percent  
Minor components: 5 percent

## Component Descriptions

### Remorris soils

*Landform:* Hillslopes on structural benches, escarpments  
*Parent material:* Colluvium, residuum  
*Slope:* 30 to 60 percent  
*Surface fragments:* About 30 percent channers, about 20 percent flagstones, about 10 percent stones, about 10 percent boulders  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 2.6 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 20 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash  
*Land capability subclass (nonirrigated):* 7s

### Typical Profile:

A—0 to 3 inches; silty clay loam  
C1—3 to 10 inches; silty clay loam  
C2—10 to 15 inches; silty clay loam  
Cr—15 inches; weathered bedrock

### Kenzo, steep soils

*Landform:* Escarpments on structural benches  
*Parent material:* Eolian sand, residuum  
*Slope:* 30 to 60 percent  
*Surface fragments:* About 40 percent gravel, about 20 percent cobbles, about 10 percent stones, about 5 percent boulders  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.9 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Steep Shallow Loam (Utah  
 Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah  
 serviceberry, roundleaf buffaloberry, Indian  
 ricegrass, twoneedle pinyon, broom snakeweed,  
 galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 3 inches; gravelly sandy loam  
 C—3 to 8 inches; gravelly loam  
 R—8 inches; bedrock

**Morrison and Entrada Formation Rock outcrop**

*Landform:* Cliffs on escarpments

*Slope:* 30 to 80 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Arches, dry and similar soils

*Composition:* About 5 percent

*Landform:* Sand sheets on structural benches

*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Sand (Utah  
 Juniper-Pinyon)

**5033—Yarts fine sandy loam, 15 to 40  
 percent slopes, eroded**

**Map Unit Setting**

*Elevation:* 5,000 to 5,510 feet (1,524 to 1,680 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305  
 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0  
 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located south of the town of Escalante, in the  
 Escalante River drainage, along the Hole-in-the-  
 Rock Road.

*Geology:* Entrada Formation (Je)

**Map Unit Composition**

Yarts, eroded and similar soils: 85 percent

Minor components: 15 percent

**Component Descriptions**

**Yarts, eroded soils**

*Landform:* Plains on structural benches

*Parent material:* Alluvium, eolian sand

*Slope:* 15 to 40 percent

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.1 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Fourwing  
 Saltbush)

*Potential native vegetation:* Indian ricegrass,  
 needleandthread, fourwing saltbush, galleta, sand  
 dropseed, Cutler Mormon tea, winterfat

*Land capability subclass (nonirrigated):* 6e

*Typical Profile:*

A—0 to 4 inches; fine sandy loam

C1—4 to 22 inches; fine sandy loam

C2—22 to 60 inches; fine sandy loam

**Minor Components**

Milok, cool and similar soils

*Composition:* About 10 percent

*Landform:* Plains on structural benches

*Depth to restrictive feature:* 40 to 60 inches to  
 bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Fourwing  
 Saltbush)

Cannonville Member, Entrada Formation Rock outcrop

*Composition:* About 5 percent

**5034—Nonip very channery loam, 5 to 25  
 percent slopes**

**Map Unit Setting**

*Elevation:* 5,000 to 6,200 feet (1,524 to 1,890 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305  
 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0  
 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, in the Escalante River Drainage, along the Hole-in-the-Rock Road near Tenmile Flat.

*Geology:* Carmel Formation, Paria River Member (Jcp); Page Sandstone and Judd Hollow Tongue of Carmel Formation (Jp)

#### Map Unit Composition

Nonip and similar soils: 85 percent  
Minor components: 15 percent

#### Component Descriptions

##### Nonip soils

*Landform:* Hillslopes on structural benches  
*Parent material:* Siltstone, limestone and shale residuum  
*Slope:* 5 to 25 percent  
*Surface fragments:* About 85 percent channers  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.5 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Galleta-Utah Juniper)  
*Potential native vegetation:* Utah juniper, Indian ricegrass, blue grama, Mexican cliffrose, broom snakeweed, galleta, gooseberryleaf globemallow, needleandthread  
*Land capability subclass (nonirrigated):* 7e

##### Typical Profile:

A—0 to 1 inch; very channery loam  
C—1 to 5 inches; very channery loam  
R—5 inches; bedrock

##### Minor Components

Paria River member, Carmel Formation Rock outcrop  
*Composition:* About 10 percent  
*Landform:* Hillslopes on structural benches  
Lazear, dry and similar soils  
*Composition:* About 5 percent  
*Landform:* Dissected hillslopes on structural benches  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

### 5035—Earlweed-Mido complex, 2 to 30 percent slopes

#### Map Unit Setting

*Elevation:* 5,000 to 5,800 feet (1,524 to 1,768 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near Sunset Flat and south of the town of Escalante near Alvey Wash.

*Geology:* Entrada Sandstone (Je); Carmel Formation (Jc)

#### Map Unit Composition

Earlweed and similar soils: 50 percent  
Mido and similar soils: 40 percent  
Minor components: 10 percent

#### Component Descriptions

##### Earlweed soils

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand, sandstone residuum  
*Slope:* 2 to 15 percent  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 20 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush  
*Land capability subclass (nonirrigated):* 5c

##### Typical Profile:

A1—0 to 4 inches; fine sand  
A2—4 to 12 inches; fine sand  
Bw—12 to 24 inches; fine sand  
Bk1—24 to 40 inches; fine sand  
Bk2—40 to 60 inches; fine sand

**Mido soils**

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 30 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 1 inch; fine sand

C—1 to 60 inches; fine sand

**Minor Components**

Earlweed family and similar soils

*Composition:* About 5 percent

*Landform:* Sand sheets on structural benches

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

Yarts and similar soils

*Composition:* About 5 percent

*Landform:* Plains on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

**5037—Barx fine sandy loam, 2 to 10 percent slopes****Map Unit Setting**

*Elevation:* 5,000 to 6,400 feet (1,524 to 1,951 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante,

along the Hole-in-the-Rock Road, in the Collet

Canyon area and around the town of Cannonville.

*Geology:* Entrada Sandstone (Je); Moenkopi Formation, Lower Red Member (TRml)

**Map Unit Composition**

Barx and similar soils: 85 percent

Minor components: 15 percent

**Component Descriptions****Barx soils**

*Landform:* Alluvial flats

*Parent material:* Alluvium, reworked eolian material

*Slope:* 2 to 10 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.9 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 40 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 6e

*Typical Profile:*

A—0 to 5 inches; fine sandy loam

Bt—5 to 12 inches; sandy clay loam

Bw—12 to 31 inches; sandy loam

Bk—31 to 48 inches; sandy loam

C—48 to 60 inches; sandy loam

**Minor Components**

Mivida, moist and similar soils

*Composition:* About 10 percent

*Landform:* Plains on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

Bowdish family and similar soils

*Composition:* About 5 percent

*Landform:* Dipslopes on structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

### 5038—Mido-Rock outcrop (Entrada Formation) complex, 5 to 40 percent slopes

#### Map Unit Setting

*Elevation:* 5,000 to 5,700 feet (1,524 to 1,738 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* The composition of this map unit includes about 25 percent of a component similar to Mido, but deep, with a bedrock contact between 100 to 150 cm. Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, around Little Valley Wash and along the Cockscomb.

*Geology:* Entrada Sandstone, Gunsight Butte Member (Je)

#### Map Unit Composition

Mido and similar soils: 70 percent

Entrada Sandstone Rock outcrop: 20 percent

Minor components: 10 percent

#### Component Descriptions

##### Mido soils

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 5 to 40 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; fine sand

C—4 to 60 inches; fine sand

##### Entrada Sandstone Rock outcrop

*Landform:* Structural benches

*Slope:* 15 to 40 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Minor Components

Milok, cool and similar soils

*Composition:* About 5 percent

*Landform:* Plains on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Arches, dry and similar soils

*Composition:* About 5 percent

*Landform:* Sand sheets on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)

### 5040—Sazi-Milok, cool complex, 2 to 30 percent slopes

#### Map Unit Setting

*Elevation:* 4,600 to 5,500 feet (1,402 to 1,677 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road near Sunset flat, along the Cockscomb near Highway 89 and south of Cannonville in the Big Dry Valley.

*Geology:* Entrada Sandstone (Je); Carmel Formation, Winsor Member (Jcw)

#### Map Unit Composition

Sazi and similar soils: 50 percent

Milok, cool and similar soils: 35 percent

Minor components: 15 percent

#### Component Descriptions

##### Sazi soils

*Landform:* Structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 30 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.6 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 6s

**Typical Profile:**

A—0 to 5 inches; fine sandy loam  
 Bw—5 to 20 inches; fine sandy loam  
 Bk—20 to 38 inches; fine sandy loam  
 R—38 inches; bedrock

**Milok, cool soils**

*Landform:* alluvial flat on structural benches  
*Parent material:* Eolian sand, mixed alluvium  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.1 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 6e

**Typical Profile:**

A—0 to 4 inches; fine sandy loam  
 Bw—4 to 18 inches; fine sandy loam  
 Bk1—18 to 32 inches; fine sandy loam  
 Bk2—32 to 60 inches; fine sandy loam

**Minor Components**

Strych and similar soils  
*Composition:* About 5 percent  
*Landform:* Remnant stream terraces, alluvial flats  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)  
 Calcic Petrocalcids and similar soils

*Composition:* About 5 percent  
*Landform:* Remnant stream terraces  
*Depth to restrictive feature:* 20 to 40 inches to petrocalcic  
*Drainage class:* Well drained  
 Riverwash  
*Composition:* About 5 percent  
*Landform:* Washes and drainageways  
*Drainage class:* Well drained  
*Flooding hazard:* Occasional

**5041—Seeg, warm-Pagina complex, 2 to 15 percent slopes****Map Unit Setting**

*Elevation:* 3,500 to 4,800 feet (1,067 to 1,463 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near Sooner Bench.  
*Geology:* Entrada Sandstone (Je); Upper Carmel Formation (Jcu)

**Map Unit Composition**

Seeg, warm and similar soils: 60 percent  
 Pagina and similar soils: 30 percent  
 Minor components: 10 percent

**Component Descriptions****Seeg, warm soils**

*Landform:* Fan terraces  
*Parent material:* Mixed alluvium  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 15 percent gravel, about 3 percent cobbles, about 5 percent stones, about 3 percent boulders  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 2.9 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Stony Loam (Blackbrush)  
*Potential native vegetation:* blackbrush, galleta, Torrey

Mormon tea, broom snakeweed, fourwing saltbush, shadscale

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 3 inches; gravelly loamy fine sand  
 Bw—3 to 8 inches; very gravelly sandy loam  
 Bk1—8 to 15 inches; very gravelly sandy loam  
 Bk2—15 to 35 inches; very cobbly loamy sand  
 C—35 to 60 inches; extremely stony loamy sand

**Pagina soils**

*Landform:* Low hills on alluvial fan terraces

*Parent material:* Eolian sand, mixed alluvium

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.7 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; loamy fine sand  
 Bw—4 to 17 inches; sandy loam  
 Bk1—17 to 25 inches; sandy loam  
 Bk2—25 to 31 inches; gravelly loamy sand  
 Cr—31 to 33 inches; weathered bedrock

**Minor Components**

Pagina Family and similar soils

*Composition:* About 5 percent

*Landform:* Low hills on alluvial fan terraces

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Desert Sandy Loam (Blackbrush)

Nakai and similar soils

*Composition:* About 3 percent

*Landform:* Sand sheets

*Drainage class:* Well drained

*Ecological site:* Desert Sandy Loam (Fourwing Saltbush)

Sheppard and similar soils

*Composition:* About 2 percent

*Landform:* Dunes

*Drainage class:* Somewhat excessively drained

*Ecological site:* Desert Sand (Sand Sagebrush)

**5042—Moenkopie, warm-Moepitz-Rock outcrop (Carmel Formation) complex, 10 to 30 percent slopes**

**Map Unit Setting**

*Elevation:* 4,000 to 5,000 feet (1,220 to 1,524 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near Big Hollow Wash.

*Geology:* Entrada Sandstone (Je); Carmel Formation, Paria River Member (Jcp); Carmel Formation, Winsor Member (Jcw)

**Map Unit Composition**

Moenkopie, warm and similar soils: 40 percent

Moepitz and similar soils: 25 percent

Carmel Formation Rock outcrop: 25 percent

Minor components: 10 percent

**Component Descriptions**

**Moenkopie, warm soils**

*Landform:* Hillslopes on structural benches

*Parent material:* Sandstone and shale residuum

*Slope:* 10 to 30 percent

*Surface fragments:* About 3 percent gravel, about 1 percent cobbles

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.0 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Cutler Mormon tea, galleta, Indian ricegrass

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

- A—0 to 6 inches; loamy fine sand
- C—6 to 12 inches; loamy sand
- R—12 inches; bedrock

**Moepitz soils**

*Landform:* Hillslopes on structural benches, breaks

*Parent material:* Mixed alluvium, eolian sand

*Slope:* 10 to 30 percent

*Surface fragments:* About 5 percent gravel, about 5 percent cobbles, about 3 percent stones, about 2 percent boulders

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

- A—0 to 3 inches; loamy fine sand
- AC—3 to 8 inches; loamy fine sand
- C—8 to 28 inches; sandy loam
- R—28 inches; bedrock

**Carmel Formation Rock outcrop**

*Landform:* Scarps on structural benches

*Slope:* 15 to 70 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Seeg, warm and similar soils

*Composition:* About 5 percent

*Landform:* Small fan remnants

*Drainage class:* Well drained

*Ecological site:* Desert Stony Loam (Blackbrush)

Typic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Scarps on structural benches

*Drainage class:* Well drained

**5043—Daklos, steep-Rock outcrop (Morrison Formation and Romana Mesa Sandstone) complex, 30 to 70 percent slopes**

**Map Unit Setting**

*Elevation:* 5,200 to 6,500 feet (1,585 to 1,982 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, west of the Hole-in-the-Rock Road, on the escarpment of Fiftymile Bench.

*Geology:* Morrison Formation (Jm); Entrada Sandstone (Je); Romana Mesa Sandstone (Jr)

**Map Unit Composition**

Daklos, steep and similar soils: 45 percent

Morrison Formation and Romano Mesa Sandstone

Rock outcrop: 40 percent

Minor components: 15 percent

**Component Descriptions**

**Daklos, steep soils**

*Landform:* Ledges on escarpments

*Parent material:* Slope alluvium, residuum

*Slope:* 30 to 70 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 5 percent stones, about 10 percent boulders

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

- A—0 to 3 inches; very cobbly fine sandy loam
- C—3 to 13 inches; very stony loam
- R—13 inches; bedrock

**Morrison Formation and Romano Mesa Sandstone  
Rock outcrop***Landform:* Cliffs*Slope:* 50 to 100 percent*Runoff class:* Very high*Land capability subclass (nonirrigated):* 8**Minor Components**

Typic Torriorthents and similar soils

*Composition:* About 10 percent*Landform:* Escarpments*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)*Drainage class:* Well drained

Dient and similar soils

*Composition:* About 5 percent*Landform:* Fan remnants*Drainage class:* Well drained*Ecological site:* Desert Stony Loam (Blackbrush)**5044—Dient very stony loam, 15 to 50  
percent slopes****Map Unit Setting***Elevation:* 4,200 to 5,500 feet (1,280 to 1,677 meters)*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)*Frost-free period:* 160 to 190 days*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near the escarpment of Fiftymile Bench, and north of Glen Canyon City along Hatch Creek.*Geology:* Entrada Sandstone (Je); Morrison Formation (Jm)**Map Unit Composition**

Dient and similar soils: 85 percent

Minor components: 15 percent

**Component Descriptions****Dient soils***Landform:* Fan remnants*Parent material:* Colluvium, alluvium*Slope:* 15 to 50 percent*Surface fragments:* About 8 percent gravel, about 10 percent cobbles, about 10 percent stones, about 15 percent boulders*Drainage class:* Well drained*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)*Available water capacity:* About 4.7 inches (low)*Shrink-swell potential:* About 4.5 percent (moderate)*Runoff class:* High*Calcium carbonate maximum:* About 15 percent*Gypsum maximum:* None*Salinity maximum:* About 4 mmhos/cm (very slightly saline)*Sodium adsorption ratio maximum:* About 0 (nonsodic)*Ecological site:* Desert Stony Loam (Blackbrush)*Potential native vegetation:* blackbrush, galleta, Torrey Mormon tea, broom snakeweed, fourwing saltbush, shadscale*Land capability subclass (nonirrigated):* 5c*Typical Profile:*

A—0 to 4 inches; very bouldery loam

C1—4 to 12 inches; very stony loam

C2—12 to 60 inches; very stony loam

**Minor Components**

Dient family and similar soils

*Composition:* About 5 percent*Landform:* Debris slides*Drainage class:* Well drained*Ecological site:* Desert Stony Loam (Blackbrush)

Typic Torriorthents and similar soils

*Composition:* About 5 percent*Landform:* Debris slides*Drainage class:* Well drained

Morrison Formation Rock outcrop

*Composition:* About 5 percent*Landform:* Debris slides**5046—Moffat-Sheppard-Nakai complex, 2  
to 30 percent slopes****Map Unit Setting***Elevation:* 4,200 to 4,900 feet (1,280 to 1,494 meters)*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)*Frost-free period:* 160 to 190 days*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near the Dry Fork of Coyote Gulch and Sooner Bench.*Geology:* Entrada Sandstone (Je)

**Map Unit Composition**

Moffat and similar soils: 30 percent  
 Sheppard and similar soils: 30 percent  
 Nakai and similar soils: 25 percent  
 Minor components: 15 percent

**Component Descriptions****Moffat soils**

*Landform:* Plains on structural benches  
*Parent material:* Eolian sand, alluvium  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 6.7 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sandy Loam (Blackbrush)  
*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 5 inches; loamy fine sand  
 Bk1—5 to 13 inches; sandy loam  
 Bk2—13 to 29 inches; sandy loam  
 Bk3—29 to 60 inches; fine sandy loam

**Sheppard soils**

*Landform:* Dunes on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 30 percent  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 4.8 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sand (Sand Sagebrush)  
*Potential native vegetation:* Indian ricegrass, sand dropseed, sand sagebrush, Cutler Mormon tea, fourwing saltbush, gooseberryleaf globemallow, sand buckwheat, sandhill muhly  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 5 inches; loamy fine sand  
 C1—5 to 35 inches; fine sand  
 C2—35 to 60 inches; fine sand

**Nakai soils**

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.3 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, galleta, fourwing saltbush, gooseberryleaf globemallow, mesa dropseed, painted milkvetch, sand dropseed, spike dropseed  
*Land capability subclass (nonirrigated):* 5s

*Typical Profile:*

A—0 to 3 inches; sandy loam  
 Bw1—3 to 10 inches; sandy loam  
 Bw2—10 to 20 inches; fine sandy loam  
 Bk1—20 to 28 inches; sandy loam  
 Bk2—28 to 42 inches; sandy loam  
 C—42 to 60 inches; sandy loam

**Minor Components**

Seeg, warm and similar soils  
*Composition:* About 8 percent  
*Landform:* Small fan remnants  
*Drainage class:* Well drained  
*Ecological site:* Desert Stony Loam (Blackbrush)  
 Mack, moist and similar soils  
*Composition:* About 4 percent  
*Landform:* Plains on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Desert Sandy Loam (Blackbrush)  
 Typic Petrocalcids and similar soils  
*Composition:* About 2 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 8 to 20 inches to petrocalcic  
*Drainage class:* Well drained

Entrada Sandstone Rock outcrop

*Composition:* About 1 percent

*Landform:* Structural benches

### **5047—Moffat-Seeg, warm-Mack, moist complex, 2 to 15 percent slopes**

#### **Map Unit Setting**

*Elevation:* 4,200 to 5,000 feet (1,280 to 1,524 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near the Dry Fork of Coyote Gulch.

*Geology:* Entrada Sandstone (Je)

#### **Map Unit Composition**

Moffat and similar soils: 40 percent

Seeg, warm and similar soils: 25 percent

Mack, moist and similar soils: 20 percent

Minor components: 15 percent

#### **Component Descriptions**

##### **Moffat soils**

*Landform:* Plains on structural benches, fan remnants

*Parent material:* Alluvium, eolian sand

*Slope:* 2 to 8 percent

*Surface fragments:* About 1 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.0 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 25 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 5c

##### *Typical Profile:*

A—0 to 6 inches; loamy fine sand

Bw—6 to 17 inches; sandy loam

Bk1—17 to 28 inches; sandy loam

Bk2—28 to 41 inches; sandy loam

Bk3—41 to 60 inches; sandy loam

##### **Seeg, warm soils**

*Landform:* Fan remnants

*Parent material:* Mixed alluvium

*Slope:* 5 to 15 percent

*Surface fragments:* About 14 percent gravel, about 12 percent cobbles, about 2 percent stones, about 2 percent boulders

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Stony Loam (Blackbrush)

*Potential native vegetation:* blackbrush, galleta, Torrey Mormon tea, broom snakeweed, fourwing saltbush, shadscale

*Land capability subclass (nonirrigated):* 5c

##### *Typical Profile:*

A—0 to 4 inches; gravelly loamy fine sand

Bw—4 to 20 inches; gravelly loam

Bk1—20 to 30 inches; very gravelly loam

Bk2—30 to 60 inches; very gravelly fine sandy loam

##### **Mack, moist soils**

*Landform:* Fan remnants

*Parent material:* Mixed alluvium, eolian sand

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 7.4 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 25 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 5c

##### *Typical Profile:*

A—0 to 7 inches; loamy fine sand

AB—7 to 12 inches; fine sandy loam

Bt—12 to 29 inches; loam

Bk1—29 to 50 inches; sandy loam

Bk2—50 to 60 inches; sandy loam

**Minor Components**

Typic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Drainage class:* Well drained

Sheppard and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Drainage class:* Somewhat excessively drained

*Ecological site:* Desert Sand (Sand Sagebrush)

Typic Petrocalcids and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 8 to 20 inches to petrocalcic

*Drainage class:* Well drained

**5049—Moffat-Mack, moist complex, 1 to 5 percent slopes****Map Unit Setting**

*Elevation:* 4,500 to 5,100 feet (1,372 to 1,555 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, west of the Dry Fork of Coyote Gulch.

*Geology:* Entrada Sandstone (Je); Carmel Formation, Paria River Member (Jcp)

**Map Unit Composition**

Moffat and similar soils: 50 percent

Mack, moist and similar soils: 35 percent

Minor components: 15 percent

**Component Descriptions****Moffat soils**

*Landform:* Plains on structural benches, fan remnants

*Parent material:* Alluvium, eolian sand

*Slope:* 1 to 5 percent

*Surface fragments:* About 1 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.0 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 20 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 5c

**Typical Profile:**

A—0 to 3 inches; loamy fine sand

Bw—3 to 18 inches; sandy loam

Bk1—18 to 39 inches; sandy loam

Bk2—39 to 60 inches; sandy loam

**Mack, moist soils**

*Landform:* Fan remnants

*Parent material:* Mixed alluvium, eolian sand

*Slope:* 1 to 5 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 7.2 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 25 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 5c

**Typical Profile:**

A—0 to 6 inches; loamy fine sand

AB—6 to 14 inches; fine sandy loam

Bt—14 to 25 inches; loam

Bk1—25 to 40 inches; sandy loam

Bk2—40 to 60 inches; sandy loam

**Minor Components**

Nakai and similar soils

*Composition:* About 10 percent

*Landform:* Sand sheets on structural benches

*Drainage class:* Well drained

*Ecological site:* Desert Sandy Loam (Fourwing Saltbush)

Sheppard and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Drainage class:* Somewhat excessively drained  
*Ecological site:* Desert Sand (Sand Sagebrush)

## 5050—Daklos-Arches, dry complex, 2 to 15 percent slopes

### Map Unit Setting

*Elevation:* 5,100 to 6,600 feet (1,555 to 2,012 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Seep and Sunset Flats and southwest of the town of Escalante on Wiggler Bench.  
*Geology:* Morrison Formation (Jm); Dakota Sandstone (Kd)

### Map Unit Composition

Daklos and similar soils: 45 percent  
 Arches, dry and similar soils: 40 percent  
 Minor components: 15 percent

### Component Descriptions

#### Daklos soils

*Landform:* Structural benches  
*Parent material:* Slope alluvium, residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 5 percent gravel  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.0 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 3 inches; loam  
 C—3 to 10 inches; very gravelly loam  
 R—10 inches; bedrock

#### Arches, dry soils

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 15 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 1.3 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 8 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)  
*Potential native vegetation:* Bigelow sagebrush, Utah juniper, roundleaf buffaloberry, Indian ricegrass, Mexican cliffrose, Torrey Mormon tea, Wright birdbeak, broom snakeweed, galleta, rubber rabbitbrush, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 4 inches; fine sand  
 C—4 to 16 inches; fine sand  
 R—16 inches; bedrock

#### Minor Components

Dakota Formation Rock outcrop  
*Composition:* About 5 percent  
*Landform:* Structural benches  
 Mido family and similar soils  
*Composition:* About 5 percent  
*Landform:* Dunes on structural benches  
*Drainage class:* Excessively drained  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
 Barx and similar soils  
*Composition:* About 5 percent  
*Landform:* Alluvial flats, alluvial fans  
*Drainage class:* Well drained

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

## 5052—Yarts-Suwanee complex, 1 to 8 percent slopes

### Map Unit Setting

*Elevation:* 5,000 to 5,500 feet (1,524 to 1,677 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road on Sunset Flat.

*Geology:* Entrada Sandstone, Cannonville Member (Je)

### Map Unit Composition

Yarts and similar soils: 45 percent

Suwanee and similar soils: 40 percent

Minor components: 15 percent

### Component Descriptions

#### Yarts soils

*Landform:* Stream terraces

*Parent material:* Alluvium, eolian sand

*Slope:* 1 to 8 percent

*Surface fragments:* About 1 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 8.3 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 2 inches; fine sandy loam

C1—2 to 16 inches; fine sandy loam

C2—16 to 24 inches; fine sandy loam

C3—24 to 54 inches; fine sandy loam

C4—54 to 60 inches; loam

#### Suwanee soils

*Landform:* Stream terraces

*Parent material:* Mixed alluvium

*Slope:* 1 to 5 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 8.8 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* About 3 percent

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Sandy Bottom (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, galleta, fourwing saltbush, green Mormon tea, sand dropseed, scarlet globemallow, winterfat

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 6 inches; silty clay loam

C1—6 to 16 inches; clay loam

C2—16 to 27 inches; silt loam

C3—27 to 36 inches; silt loam

C4—36 to 60 inches; stratified loam to loamy fine sand

#### Minor Components

Ustic Torrifluvents and similar soils

*Composition:* About 10 percent

*Landform:* Channels on alluvial fans

*Drainage class:* Somewhat poorly drained

Carmel and Entrada Formation Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

## 5053—Milok fine sand, 2 to 8 percent slopes

### Map Unit Setting

*Elevation:* 4,700 to 5,200 feet (1,433 to 1,585 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Sunset Flat.  
*Geology:* Entrada Sandstone (Je)

#### Map Unit Composition

Milok and similar soils: 85 percent  
 Minor components: 15 percent

#### Component Descriptions

##### Milok soils

*Landform:* Alluvial flats on structural benches  
*Parent material:* Alluvium, eolian sand  
*Slope:* 2 to 8 percent  
*Surface fragments:* About 2 percent gravel  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 5.9 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Blackbrush)  
*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, fourwing saltbush, galleta, needleandthread  
*Land capability subclass (nonirrigated):* 5c

##### Typical Profile:

A—0 to 7 inches; fine sand  
 AB—7 to 15 inches; loamy sand  
 Bk1—15 to 34 inches; sandy loam  
 Bk2—34 to 55 inches; sandy loam  
 C—55 to 60 inches; sandy loam

##### Minor Components

Mivida, warm and similar soils  
*Composition:* About 8 percent  
*Landform:* Plains on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Sandy Loam (Blackbrush)  
 Loamy-skeletal Ustic Torriorthents and similar soils  
*Composition:* About 5 percent  
*Landform:* Plain structural benches  
*Drainage class:* Well drained  
 Entrada Sandstone Rock outcrop  
*Composition:* About 2 percent  
*Landform:* Slickrock on structural benches

### 5055—Mivida-Barx, dry complex, 1 to 8 percent slopes

#### Map Unit Setting

*Elevation:* 5,300 to 5,690 feet (1,616 to 1,734 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Seep and Tenmile Flats and near Highway 89 on West Clark Bench.  
*Geology:* Entrada Sandstone (Je)

#### Map Unit Composition

Mivida and similar soils: 50 percent  
 Barx, dry and similar soils: 40 percent  
 Minor components: 10 percent

#### Component Descriptions

##### Mivida soils

*Landform:* Plains on structural benches  
*Parent material:* Eolian sand, mixed alluvium  
*Slope:* 1 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 8.2 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 5c  
*Typical Profile:*  
 A—0 to 2 inches; loamy fine sand  
 Bw—2 to 36 inches; fine sandy loam  
 Bk—36 to 60 inches; fine sandy loam

##### Barx, dry soils

*Landform:* Alluvial flats  
*Parent material:* Alluvium, reworked eolian material  
*Slope:* 1 to 5 percent

*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 10.2 inches (high)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 40 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 5c

**Typical Profile:**

A—0 to 4 inches; fine sandy loam  
 Bw—4 to 11 inches; loam  
 Bt—11 to 18 inches; clay loam  
 Btk—18 to 26 inches; clay loam  
 Bk—26 to 60 inches; loam

**Minor Components**

Yarts and similar soils

*Composition:* About 5 percent  
*Landform:* Plains  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Mido and similar soils

*Composition:* About 3 percent  
*Landform:* Dunes  
*Drainage class:* Excessively drained  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)

Suwanee and similar soils

*Composition:* About 2 percent  
*Landform:* Alluvial flats, flood plains  
*Drainage class:* Well drained  
*Flooding hazard:* Very Rare  
*Ecological site:* Sandy Bottom (Fourwing Saltbush)

**5057—Arches, dry-Mident-Yarts complex, 2 to 40 percent slopes****Map Unit Setting**

*Elevation:* 5,200 to 6,100 feet (1,585 to 1,860 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, in the area of Tenmile Flat, Dave Canyon, and Sunset Flat.

*Geology:* Entrada Formation, Cannonville Member (Je)

**Map Unit Composition**

Mident and similar soils: 30 percent  
 Arches, dry and similar soils: 30 percent  
 Yarts and similar soils: 25 percent  
 Minor components: 15 percent

**Component Descriptions****Mident soils**

*Note:* The Cr horizon can be dug with a spade. Hard bedrock exists between 20 to 30 inches.

*Landform:* Hillslopes on structural benches

*Parent material:* Eolian sand, sandstone residuum

*Slope:* 2 to 40 percent

*Surface fragments:* About 1 percent gravel

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 0.7 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)

*Potential native vegetation:* Bigelow sagebrush, Utah juniper, roundleaf buffaloberry, Indian ricegrass, Mexican cliffrose, Torrey Mormon tea, Wright birdbeak, broom snakeweed, galleta, rubber rabbitbrush, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

**Typical Profile:**

A—0 to 3 inches; fine sand  
 C—3 to 10 inches; fine sand  
 Cr—10 inches; weathered bedrock

**Arches, dry soils**

*Landform:* Sand sheets on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 40 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 1.1 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 8 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)  
*Potential native vegetation:* Bigelow sagebrush, Utah juniper, roundleaf buffaloberry, Indian ricegrass, Mexican cliffrose, Torrey Mormon tea, Wright birdbeak, broom snakeweed, galleta, rubber rabbitbrush, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 7s

**Typical Profile:**

A—0 to 3 inches; loamy fine sand  
 C—3 to 12 inches; loamy fine sand  
 R—12 inches; bedrock

**Yarts soils**

*Landform:* Plains on structural benches  
*Parent material:* Eolian sand, alluvium  
*Slope:* 2 to 40 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.0 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 5c  
**Typical Profile:**  
 A1—0 to 4 inches; loamy fine sand  
 A2—4 to 12 inches; fine sandy loam  
 C1—12 to 42 inches; fine sandy loam  
 C2—42 to 60 inches; fine sandy loam

**Minor Components**

Entrada Sandstone Rock outcrop  
*Composition:* About 10 percent

*Landform:* Structural benches  
 Mivida and similar soils  
*Composition:* About 5 percent  
*Landform:* Alluvial flats on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

**5058—Earlweed-Mivida complex, 2 to 20 percent slopes****Map Unit Setting**

*Elevation:* 5,200 to 6,100 feet (1,585 to 1,860 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Tenmile and Seep Flats.  
*Geology:* Entrada Sandstone (Je)

**Map Unit Composition**

Earlweed and similar soils: 45 percent  
 Mivida and similar soils: 40 percent  
 Minor components: 15 percent

**Component Descriptions****Earlweed soils**

*Landform:* Dunes on structural benches  
*Parent material:* Sandstone residuum, eolian sand  
*Slope:* 2 to 20 percent  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 20 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush  
*Land capability subclass (nonirrigated):* 5c

**Typical Profile:**

A—0 to 4 inches; loamy fine sand

Bw—4 to 22 inches; loamy fine sand  
 Bk1—22 to 36 inches; loamy fine sand  
 Bk2—36 to 50 inches; loamy fine sand  
 C—50 to 60 inches; loamy fine sand

### Mivida soils

*Landform:* Plains on structural benches  
*Parent material:* Mixed alluvium, eolian sand  
*Slope:* 2 to 15 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.0 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A1—0 to 2 inches; loamy fine sand  
 A2—2 to 10 inches; fine sandy loam  
 Bw—10 to 21 inches; fine sandy loam  
 Bk1—21 to 28 inches; fine sandy loam  
 Bk2—28 to 50 inches; fine sandy loam  
 Bk3—50 to 60 inches; fine sandy loam

### Minor Components

Mident and similar soils

*Composition:* About 8 percent  
*Landform:* Hillslopes on structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)

Arches, dry and similar soils

*Composition:* About 7 percent  
*Landform:* Sand sheets on structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)

## 5059—Mivida-Yarts, moist complex, 2 to 8 percent slopes

### Map Unit Setting

*Elevation:* 5,200 to 6,100 feet (1,585 to 1,860 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, in the area of Sunset Flat and Dave Canyon and southeast of Cannonville near Kodachrome Basin State Park.  
*Geology:* Entrada Sandstone (Je); Carmel Formation, Winsor Member (Jcw)

### Map Unit Composition

Mivida and similar soils: 50 percent  
 Yarts, moist and similar soils: 40 percent  
 Minor components: 10 percent

### Component Descriptions

### Mivida soils

*Landform:* Plains on structural benches  
*Parent material:* Mixed alluvium, eolian sand  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.3 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A1—0 to 8 inches; fine sandy loam  
 A2—8 to 16 inches; fine sandy loam  
 Bw—16 to 28 inches; fine sandy loam  
 Bk1—28 to 42 inches; sandy loam

Bk2—42 to 60 inches; loam

### Yarts, moist soils

*Landform:* Plains on structural benches

*Parent material:* Eolian sand, alluvium

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.1 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Indian ricegrass, needleandthread, Wyoming big sagebrush, fourwing saltbush, galleta, green Mormon tea

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 6 inches; fine sandy loam

C—6 to 60 inches; fine sandy loam

### Minor Components

Milok, cool and similar soils

*Composition:* About 4 percent

*Landform:* Plains on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

Mido and similar soils

*Composition:* About 3 percent

*Landform:* Dunes

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

Barx and similar soils

*Composition:* About 3 percent

*Landform:* Alluvial flats

*Drainage class:* Well drained

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

## 5060—Ranion-Suzipon-Rock outcrop (Navajo Sandstone) complex, 2 to 30 percent slopes

### Map Unit Setting

*Elevation:* 4,600 to 5,200 feet (1,402 to 1,585 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near the Dry Fork of Coyote Gulch and Fortymile Ridge.

*Geology:* Navajo Sandstone (Jn)

### Map Unit Composition

Ranion and similar soils: 30 percent

Suzipon and similar soils: 30 percent

Navajo Sandstone Rock outcrop: 20 percent

Minor components: 20 percent

### Component Descriptions

#### Ranion soils

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 30 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 5.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 7 inches; loamy fine sand

C1—7 to 29 inches; loamy fine sand

C2—29 to 60 inches; loamy fine sand

#### Suzipon soils

*Landform:* Sand sheets on structural benches, dunes on structural benches

*Parent material:* Eolian sand, sandstone residuum

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.1 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0  
 (nonsodic)

*Ecological site:* Desert Shallow Sandy Loam  
 (Blackbrush)

*Potential native vegetation:* blackbrush, Cutler Mormon  
 tea, galleta, Indian ricegrass

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 3 inches; loamy fine sand  
 C1—3 to 8 inches; loamy fine sand  
 C2—8 to 12 inches; loamy fine sand  
 R—12 inches; bedrock

**Navajo Sandstone Rock outcrop**

*Landform:* Structural benches

*Slope:* 2 to 30 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Spooky and similar soils

*Composition:* About 10 percent

*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 40 to 60 inches to  
 bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Desert Sandy Loam (Blackbrush)

Peekaboo and similar soils

*Composition:* About 10 percent

*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 20 to 40 inches to  
 bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Desert Sand (Sand Sagebrush)

**5061—Rock outcrop (Navajo Sandstone)-  
 Suzipon-Peekaboo complex, 2 to 30  
 percent slopes**

**Map Unit Setting**

*Elevation:* 4,500 to 5,200 feet (1,372 to 1,585 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229  
 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0  
 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante,  
 along the Hole-in-the-Rock Road, near the Dry Fork  
 of Coyote Gulch and Fortymile Ridge.

*Geology:* Navajo Sandstone (Jn)

**Map Unit Composition**

Navajo Sandstone Rock outcrop: 50 percent

Suzipon and similar soils: 25 percent

Peekaboo and similar soils: 15 percent

Minor components: 10 percent

**Component Descriptions**

**Navajo Sandstone Rock outcrop**

*Landform:* Slickrock on structural benches

*Slope:* 2 to 30 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Suzipon soils**

*Landform:* Sand sheets on structural benches

*Parent material:* Eolian sand, sandstone residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 10 percent gravel, about 1  
 percent cobbles

*Depth to restrictive feature:* 4 to 20 inches to bedrock  
 (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 0.7 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Shallow Sandy Loam  
 (Blackbrush)

*Potential native vegetation:* blackbrush, Cutler Mormon  
 tea, galleta, Indian ricegrass

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 8 inches; loamy fine sand

R—8 inches; bedrock

**Peekaboo soils**

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand, sandstone residuum

*Slope:* 2 to 30 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock  
 (lithic)

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 2.0 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sand (Sand Sagebrush)  
*Potential native vegetation:* Indian ricegrass, sand dropseed, sand sagebrush, Cutler Mormon tea, fourwing saltbush, gooseberryleaf globemallow, sand buckwheat, sandhill muhly  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; loamy fine sand  
 C—3 to 22 inches; loamy fine sand  
 R—22 inches; bedrock

**Minor Components**

Ranion and similar soils

*Composition:* About 5 percent  
*Landform:* Dunes on structural benches  
*Drainage class:* Excessively drained  
*Ecological site:* Desert Sandy Loam (Blackbrush)

Spooky and similar soils

*Composition:* About 5 percent  
*Landform:* Dunes on structural benches  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Ecological site:* Desert Sandy Loam (Blackbrush)

**5062—Peekaboo-Spooky-Suzipon complex, 2 to 15 percent slopes**

**Map Unit Setting**

*Elevation:* 4,500 to 5,200 feet (1,372 to 1,585 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near the Dry Fork of Coyote Gulch.  
*Geology:* Navajo Sandstone (Jn)

**Map Unit Composition**

Peekaboo and similar soils: 50 percent  
 Spooky and similar soils: 25 percent  
 Suzipon and similar soils: 15 percent  
 Minor components: 10 percent

**Component Descriptions**

**Peekaboo soils**

*Landform:* Dunes on structural benches  
*Parent material:* Eolian sand, sandstone residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 2 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 2.6 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sand (Sand Sagebrush)  
*Potential native vegetation:* Indian ricegrass, sand dropseed, sand sagebrush, Cutler Mormon tea, fourwing saltbush, gooseberryleaf globemallow, sand buckwheat, sandhill muhly  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; loamy fine sand  
 C1—4 to 12 inches; loamy fine sand  
 C2—12 to 29 inches; loamy fine sand  
 R—29 inches; bedrock

**Spooky soils**

*Landform:* Dunes on structural benches  
*Parent material:* Eolian sand, sandstone residuum  
*Slope:* 2 to 15 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 4.1 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sandy Loam (Blackbrush)  
*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

- A—0 to 4 inches; loamy fine sand
- C1—4 to 14 inches; loamy fine sand
- C2—14 to 38 inches; loamy fine sand
- C3—38 to 46 inches; loamy fine sand
- R—46 inches; bedrock

**Suzipon soils**

*Landform:* Sand sheets on structural benches

*Parent material:* Sandstone residuum, eolian sand

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.7 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Cutler Mormon tea, galleta, Indian ricegrass

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

- A—0 to 4 inches; loamy fine sand
- C—4 to 19 inches; loamy fine sand
- R—19 inches; bedrock

**Minor Components**

Navajo Sandstone Rock outcrop

*Composition:* About 5 percent

*Landform:* Slickrock on structural benches

Ranion and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Drainage class:* Excessively drained

*Ecological site:* Desert Sandy Loam (Blackbrush)

**5063—Rock outcrop (Navajo and Carmel Formations)-Moenkopie, warm-Needle complex, 15 to 35 percent slopes**

**Map Unit Setting**

*Elevation:* 4,000 to 4,800 feet (1,220 to 1,463 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near the Dry Fork of Coyote Gulch and Fortymile Ridge.

*Geology:* Navajo Sandstone (Jn); Carmel Formation, Paria River Member (Jcp); Carmel Formation, Winsor Member (Jcw)

**Map Unit Composition**

Navajo Sandstone and Carmel Formation Rock outcrop: 40 percent

Moenkopie, warm and similar soils: 35 percent

Needle and similar soils: 15 percent

Minor components: 10 percent

**Component Descriptions**

**Navajo Sandstone and Carmel Formation Rock outcrop**

*Landform:* Escarpments and slickrock on structural benches

*Slope:* 15 to 50 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Moenkopie, warm soils**

*Landform:* Hillslopes on structural benches

*Parent material:* Siltstone and sandstone residuum

*Slope:* 15 to 30 percent

*Surface fragments:* About 15 percent gravel, about 15 percent cobbles

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.8 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Cutler Mormon tea, galleta, Indian ricegrass

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

- A—0 to 6 inches; loam
- C—6 to 13 inches; gravelly loam
- Cr—13 to 16 inches; weathered bedrock

R—16 inches; bedrock

### Needle soils

*Landform:* Sand sheets on structural benches

*Parent material:* Mixed alluvium, eolian sand

*Slope:* 15 to 35 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 5 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Cutler Mormon tea, galleta, Indian ricegrass

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 5 inches; loamy fine sand

C—5 to 13 inches; loamy fine sand

R—13 inches; bedrock

### Minor Components

Nakai and similar soils

*Composition:* About 5 percent

*Landform:* Sand sheets on structural benches

*Drainage class:* Well drained

*Ecological site:* Desert Sandy Loam (Fourwing Saltbush)

Moepitz and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes on structural benches, breaks

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Desert Sandy Loam (Blackbrush)

## 5065—Trail-Sheppard complex, 2 to 10 percent slopes

### Map Unit Setting

*Elevation:* 4,400 to 4,700 feet (1,341 to 1,433 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, near the Dry Fork of Coyote Gulch.

*Geology:* Navajo Sandstone (Jn); Entrada Sandstone (Je)

### Map Unit Composition

Trail and similar soils: 55 percent

Sheppard and similar soils: 30 percent

Minor components: 15 percent

### Component Descriptions

#### Trail soils

*Landform:* Channels, valley flats

*Parent material:* Mixed alluvium

*Slope:* 2 to 5 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 4.6 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Negligible

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Sandy Bottom (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, galleta, fourwing saltbush, gooseberryleaf globemallow, green Mormon tea, sand dropseed, winterfat

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 12 inches; loamy fine sand

C1—12 to 29 inches; loamy sand

C2—29 to 46 inches; loamy sand

C3—46 to 60 inches; sand

#### Sheppard soils

*Landform:* Dunes

*Parent material:* Eolian sand

*Slope:* 2 to 10 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 5.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sand (Sand Sagebrush)

*Potential native vegetation:* Indian ricegrass, sand dropseed, sand sagebrush, Cutler Mormon tea, fourwing saltbush, gooseberryleaf globemallow, sand buckwheat, sandhill muhly

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 6 inches; loamy fine sand

C1—6 to 32 inches; loamy fine sand

C2—32 to 60 inches; loamy fine sand

**Minor Components**

Sandy-skeletal Typic Torrifluvents and similar soils

*Composition:* About 5 percent

*Landform:* Washes

*Drainage class:* Excessively drained

Navajo Sandstone Rock outcrop

*Composition:* About 5 percent

*Landform:* Slickrock on structural benches

Sheppard and similar soils

*Composition:* About 5 percent

*Landform:* Dunes

*Drainage class:* Somewhat excessively drained

*Ecological site:* Desert Sand (Sand Sagebrush)

**5067—Ranion-Peekaboo complex, 2 to 20 percent slopes**

**Map Unit Setting**

*Elevation:* 3,800 to 4,500 feet (1,159 to 1,372 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Fortymile Ridge.

*Geology:* Navajo Sandstone (Jn)

**Map Unit Composition**

Ranion and similar soils: 70 percent

Peekaboo and similar soils: 20 percent

Minor components: 10 percent

**Component Descriptions**

**Ranion soils**

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 20 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 5.2 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 5 inches; loamy fine sand

C1—5 to 15 inches; loamy fine sand

C2—15 to 35 inches; loamy fine sand

C3—35 to 55 inches; loamy fine sand

C4—55 to 60 inches; sand

**Peekaboo soils**

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand, sandstone residuum

*Slope:* 2 to 10 percent

*Surface fragments:* About 2 percent gravel

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sand (Sand Sagebrush)

*Potential native vegetation:* Indian ricegrass, sand dropseed, sand sagebrush, Cutler Mormon tea, fourwing saltbush, gooseberryleaf globemallow, sand buckwheat, sandhill muhly

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; loamy fine sand

C1—4 to 23 inches; loamy fine sand

C2—23 to 28 inches; loamy fine sand

R—28 inches; bedrock

**Minor Components**

Dune land

*Composition:* About 6 percent

*Landform:* Dunes on structural benches

*Drainage class:* Excessively drained

Spooky and similar soils

*Composition:* About 4 percent

*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Desert Sandy Loam (Blackbrush)

## 5068—Seeg, warm-Moffat-Needle complex, 2 to 25 percent slopes

### Map Unit Setting

*Elevation:* 4,400 to 5,000 feet (1,342 to 1,524 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, below the escarpment of Fiftymile Bench near Sooner Bench.

*Geology:* Entrada Sandstone (Je)

### Map Unit Composition

Seeg, warm and similar soils: 40 percent

Moffat and similar soils: 35 percent

Needle and similar soils: 15 percent

Minor components: 10 percent

### Component Descriptions

#### Seeg, warm soils

*Landform:* Fan remnants

*Parent material:* Mixed alluvium

*Slope:* 2 to 15 percent

*Surface fragments:* About 12 percent gravel, about 5 percent cobbles, about 2 percent stones, about 1 percent boulders

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.8 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Stony Loam (Blackbrush)

*Potential native vegetation:* blackbrush, galleta, Torrey Mormon tea, broom snakeweed, fourwing saltbush, shadscale

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 5 inches; loamy fine sand

AB—5 to 12 inches; fine sandy loam

Bw—12 to 19 inches; gravelly loam

Bk1—19 to 38 inches; very gravelly loam

Bk2—38 to 60 inches; very gravelly fine sandy loam

#### Moffat soils

*Landform:* Plains on structural benches, alluvial fans

*Parent material:* Alluvium, eolian sand

*Slope:* 2 to 15 percent

*Surface fragments:* About 2 percent gravel, about 1 percent cobbles

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 6.5 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 20 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A1—0 to 5 inches; loamy fine sand

A2—5 to 19 inches; loamy fine sand

Bk1—19 to 35 inches; fine sandy loam

Bk2—35 to 55 inches; fine sandy loam

Bk3—55 to 60 inches; fine sandy loam

#### Needle soils

*Landform:* Sand sheets on structural benches

*Parent material:* Mixed alluvium, eolian sand

*Slope:* 8 to 25 percent

*Surface fragments:* About 5 percent gravel, about 3 percent cobbles, about 2 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Shallow Sandy Loam  
 (Blackbrush)  
*Potential native vegetation:* blackbrush, Cutler Mormon  
 tea, galleta, Indian ricegrass  
*Land capability subclass (nonirrigated):* 6s

**Typical Profile:**

A—0 to 4 inches; loamy fine sand  
 C1—4 to 11 inches; loamy fine sand  
 C2—11 to 17 inches; loamy fine sand  
 R—17 inches; bedrock

**Minor Components**

Mack, moist and similar soils  
*Composition:* About 5 percent  
*Landform:* Plains on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Desert Sandy Loam  
 (Blackbrush)  
 Sheppard and similar soils  
*Composition:* About 5 percent  
*Landform:* Dunes on structural benches  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Desert Sand (Sand Sagebrush)

### **5069—Rock outcrop (Entrada Formation)- Nepalto, moist complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Elevation:* 4,200 to 4,600 feet (1,280 to 1,402 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229  
 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0  
 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located southeast of the town of Escalante,  
 along the Hole-in-the-Rock Road, in drainages  
 below the escarpment of Fiftymile Bench near  
 Sooner Bench.  
*Geology:* Entrada Sandstone (Je)

**Map Unit Composition**

Entrada Sandstone Rock outcrop: 60 percent

Nepalto, moist and similar soils: 25 percent  
 Minor components: 15 percent

**Component Descriptions****Entrada Sandstone Rock outcrop**

*Landform:* Slot canyons and escarpments on structural  
 benches  
*Slope:* 15 to 90 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

**Nepalto, moist soils**

*Landform:* Drainageways and small strath terraces  
*Parent material:* Mixed alluvium  
*Slope:* 2 to 8 percent  
*Surface fragments:* About 15 percent gravel, about 10  
 percent cobbles, about 5 percent stones, about 10  
 percent boulders  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 2.1 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sandy Loam (Fourwing  
 Saltbush)  
*Potential native vegetation:* Indian ricegrass, galleta,  
 fourwing saltbush, gooseberryleaf globemallow,  
 mesa dropseed, painted milkvetch, sand dropseed,  
 spike dropseed  
*Land capability subclass (nonirrigated):* 6s

**Typical Profile:**

A—0 to 16 inches; very stony loamy sand  
 C1—16 to 34 inches; very stony sand  
 C2—34 to 52 inches; extremely stony sand  
 C3—52 to 60 inches; extremely stony sand

**Minor Components**

Riverwash  
*Composition:* About 10 percent  
*Landform:* Drainageways  
*Drainage class:* Excessively drained  
*Flooding hazard:* Occasional  
 Typic Torripsamments and similar soils  
*Composition:* About 5 percent

*Landform:* Drainageways  
*Drainage class:* Excessively drained

### **5071—Somorent-Rock outcrop (Morrison Formation) complex, 15 to 40 percent slopes**

#### **Map Unit Setting**

*Elevation:* 4,500 to 5,500 feet (1,372 to 1,677 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, along the escarpment of Fiftymile Bench near Fortymile Ridge and Sooner Bench.  
*Geology:* Entrada Sandstone (Je); Morrison Formation (Jm)

#### **Map Unit Composition**

Somorent and similar soils: 50 percent  
 Morrison Formation Rock outcrop: 40 percent  
 Minor components: 10 percent

#### **Component Descriptions**

##### **Somorent soils**

*Landform:* Hillslopes on escarpments, structural benches  
*Parent material:* Eolian sand, residuum, alluvium  
*Slope:* 15 to 40 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 1.3 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)  
*Potential native vegetation:* blackbrush, Cutler Mormon tea, galleta, Indian ricegrass  
*Land capability subclass (nonirrigated):* 7s

##### *Typical Profile:*

A—0 to 5 inches; sandy loam

C—5 to 12 inches; sandy loam  
 Cr—12 inches; weathered bedrock

##### **Morrison Formation Rock outcrop**

*Landform:* Escarpments and hillslopes  
*Slope:* 30 to 75 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

##### **Minor Components**

Dient and similar soils  
*Composition:* About 10 percent  
*Landform:* Hillslopes  
*Drainage class:* Well drained  
*Ecological site:* Desert Stony Loam (Blackbrush)

### **5073—Kenzo-Nalcase complex, 2 to 15 percent slopes**

#### **Map Unit Setting**

*Elevation:* 5,600 to 7,000 feet (1,707 to 2,134 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 54 degrees F (7.0 to 12.0 degrees C)  
*Frost-free period:* 120 to 180 days  
*Note:* Located east of the town of Boulder, along the Burr Trail, on King and Steep Creek Benches. Also located above the Vermillion Cliffs near Johnson Canyon.  
*Geology:* Kayenta Formation, main body (Jk); Navajo Sandstone (Jn); Kayenta Formation, Lamb Point Tongue of the Navajo Sandstone (Jnl); Moenave Formation (Jmo)

#### **Map Unit Composition**

Kenzo and similar soils: 60 percent  
 Nalcase and similar soils: 20 percent  
 Minor components: 20 percent

#### **Component Descriptions**

##### **Kenzo soils**

*Landform:* Structural benches  
*Parent material:* Eolian sand over residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 3 percent gravel, about 4 percent cobbles  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah  
 Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom  
 snakeweed, green Mormon tea, Fremont's  
 mahonia, Indian ricegrass, galleta, roundleaf  
 buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; loamy sand  
 C1—4 to 8 inches; sandy loam  
 C2—8 to 15 inches; gravelly sandy loam  
 R—15 inches; bedrock

**Nalcase soils**

*Landform:* Dunes on structural benches  
*Parent material:* Eolian sand, residuum, alluvium  
*Slope:* 2 to 15 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock  
 (lithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 1.0 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sand (Cutler  
 Mormon tea)  
*Potential native vegetation:* Cutler Mormon tea, Indian  
 ricegrass, Bigelow sagebrush, Havard's oak, mesa  
 dropseed, sand dropseed, sand sagebrush, shrub  
 live oak, spike dropseed  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 7 inches; fine sand  
 C1—7 to 12 inches; fine sand  
 C2—12 to 17 inches; fine sand  
 R—17 inches; bedrock

**Minor Components**

Bispen and similar soils  
*Composition:* About 10 percent  
*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 40 to 60 inches to  
 bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sand (Fourwing  
 Saltbush)

Kayenta Formation Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

Arches family and similar soils

*Composition:* About 5 percent

*Landform:* Sand sheets on structural benches

*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Sand (Utah  
 Juniper-Pinyon)

**5074—Evpark-Vessilla complex, 2 to 15  
 percent slopes**

**Map Unit Setting**

*Elevation:* 6,900 to 7,900 feet (2,104 to 2,409 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406  
 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0  
 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located northeast of the town of Big Water, on  
 Fiftymile Mountain in the Kaiparowits Plateau  
 region.  
*Geology:* Straight Cliffs Formation, John Henry  
 Member (Ksj)

**Map Unit Composition**

Evpark and similar soils: 60 percent  
 Vessilla and similar soils: 25 percent  
 Minor components: 15 percent

**Component Descriptions**

**Evpark soils**

*Landform:* Structural benches  
*Parent material:* Eolian sand, slope alluvium  
*Slope:* 2 to 8 percent  
*Surface fragments:* About 2 percent gravel, about 2  
 percent cobbles  
*Depth to restrictive feature:* 20 to 40 inches to bedrock  
 (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 3.2 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)  
*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 6 inches; fine sandy loam  
 Bw—6 to 12 inches; sandy loam  
 Bt—12 to 16 inches; loam  
 Btk—16 to 23 inches; loam  
 R—23 inches; bedrock

**Vessilla soils**

*Landform:* Structural benches  
*Parent material:* Sandstone residuum, eolian sand  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 5 percent gravel, about 5 percent flagstones  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 1.7 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 2 inches; fine sandy loam  
 C1—2 to 8 inches; fine sandy loam  
 C2—8 to 16 inches; gravelly fine sandy loam  
 R—16 inches; bedrock

**Minor Components**

Aridic Haplustalfs and similar soils  
*Composition:* About 6 percent  
*Landform:* Structural benches  
*Drainage class:* Well drained  
 Evpark family and similar soils  
*Composition:* About 5 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)  
 Ustipsamments and similar soils  
*Composition:* About 3 percent  
*Landform:* Structural benches  
*Drainage class:* Well drained  
 Straight Cliffs Formation Rock outcrop  
*Composition:* About 1 percent  
*Landform:* Structural benches

**5075—Shalona sandy loam, 2 to 8 percent slopes**

**Map Unit Setting**

*Elevation:* 6,200 to 6,600 feet (1,890 to 2,012 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located southeast of the town of Escalante, on the southeast end of Fiftymile Bench and above Butler Valley near Grosvenor Arch.  
*Geology:* Straight Cliffs Formation, Lower Member (Ksl)

**Map Unit Composition**

Shalona and similar soils: 85 percent  
 Minor components: 15 percent

**Component Descriptions**

**Shalona soils**

*Landform:* Alluvial flats on structural benches  
*Parent material:* Mixed alluvium  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 9.9 inches (high)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High

*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)  
*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass  
*Land capability subclass (nonirrigated):* 5c

**Typical Profile:**

A—0 to 8 inches; sandy loam  
 AB—8 to 13 inches; loam  
 Bt—13 to 29 inches; clay loam  
 Btk—29 to 43 inches; clay loam  
 Ck—43 to 60 inches; loam

**Minor Components**

Catahoula and similar soils  
*Composition:* About 8 percent  
*Landform:* Landslide deposits  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)  
 Shalona family and similar soils  
*Composition:* About 7 percent  
*Landform:* Alluvial flats on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)

**5076—Daklos-Catahoula complex, 2 to 30 percent slopes****Map Unit Setting**

*Elevation:* 5,200 to 6,000 feet (1,585 to 1,829 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located southeast of the town of Escalante, along the escarpment above and below Fiftymile Bench and near the Skutumpah Road along lower Podunk Creek.  
*Geology:* Tropic Shale (Kt); Dakota Formation (Kd); Morrison Formation (Jm)

**Map Unit Composition**

Daklos and similar soils: 55 percent

Catahoula and similar soils: 30 percent  
 Minor components: 15 percent

**Component Descriptions****Daklos soils**

*Landform:* Ledges on escarpments and structural benches  
*Parent material:* Slope alluvium, residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 10 percent gravel, about 5 percent cobbles, about 2 percent stones  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.6 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 20 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

**Typical Profile:**

A—0 to 4 inches; very gravelly sandy loam  
 C—4 to 8 inches; very gravelly loam  
 R—8 inches; bedrock

**Catahoula soils**

*Landform:* Landslide deposits on escarpments  
*Parent material:* Colluvium, slope alluvium  
*Slope:* 15 to 30 percent  
*Surface fragments:* About 5 percent gravel, about 15 percent cobbles, about 10 percent stones, about 10 percent boulders  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 5.3 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Indian ricegrass, Utah juniper, galleta, green Mormon tea, roundleaf buffaloberry, Wyoming big sagebrush, broom snakeweed, needleandthread, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 5s

*Typical Profile:*

- A—0 to 4 inches; very bouldery loam
- C1—4 to 29 inches; very bouldery loam
- C2—29 to 60 inches; very bouldery loam

**Minor Components**

Tropic Shale Badland

*Composition:* About 5 percent

*Landform:* Escarpments and structural benches

Dakota Formation Rock outcrop

*Composition:* About 5 percent

*Landform:* Escarpments and structural benches

Clapper, dry and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes on landslide deposits

*Drainage class:* Well drained

*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)

**5077—Gompers family-Rock outcrop (Straight Cliffs Formation)-Sheecal family complex, 50 to 80 percent slopes**

**Map Unit Setting**

*Elevation:* 6,500 to 7,500 feet (1,982 to 2,287 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)

*Frost-free period:* 70 to 90 days

*Note:* Located southeast of the town of Escalante on the escarpment of Fiftymile Mountain and above Fiftymile Bench.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Lower Member (Ksl)

**Map Unit Composition**

Gompers family and similar soils: 35 percent  
 Straight Cliffs Formation Rock outcrop: 30 percent  
 Sheecal family and similar soils: 25 percent  
 Minor components: 10 percent

**Component Descriptions**

**Gompers family soils**

*Landform:* Ledges on escarpments

*Parent material:* Slope alluvium, colluvium, residuum

*Slope:* 50 to 80 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 15 percent stones, about 10 percent boulders

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* Indian ricegrass, black sagebrush, twoneedle pinyon, antelope bitterbrush, mountain big sagebrush, Utah juniper, blue grama, needleandthread

*Land capability subclass (nonirrigated):* 6e

*Typical Profile:*

- A—0 to 4 inches; very stony loam
- C—4 to 13 inches; very stony loam
- R—13 inches; bedrock

**Straight Cliffs Formation Rock outcrop**

*Landform:* Cliffs on escarpments

*Slope:* 60 to 140 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Sheecal family soils**

*Landform:* Ledges on escarpments, hillslopes

*Parent material:* Colluvium, residuum, slope alluvium

*Slope:* 50 to 80 percent

*Surface fragments:* About 15 percent gravel, about 10 percent cobbles, about 10 percent stones, about 10 percent boulders

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Stony Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* Indian ricegrass, Sandberg bluegrass, antelope bitterbrush, mountain big sagebrush, twoneedle pinyon, James' cryptantha, Utah juniper, black sagebrush, blue grama, bottlebrush squirreltail, needleandthread  
*Land capability subclass (nonirrigated):* 6e

**Typical Profile:**

A—0 to 4 inches; very stony sandy loam  
 C1—4 to 15 inches; very cobbly loam  
 C2—15 to 34 inches; very stony clay loam  
 R—34 inches; bedrock

**Minor Components**

Aridic Ustorthents and similar soils  
*Composition:* About 10 percent  
*Landform:* Landslides on escarpments  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Well drained

**5078—Arabrab-Vessilla-Colskel complex, 2 to 15 percent slopes****Map Unit Setting**

*Elevation:* 6,300 to 7,800 feet (1,921 to 2,378 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located southeast of the town of Escalante, on the top of the Kaiparowits Plateau and around the town of Cannonville. Also located southwest of the town of Cannonville along Lower Podunk Creek.  
*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Drip Tank Member (Ksd)

**Map Unit Composition**

Arabrab and similar soils: 35 percent  
 Vessilla and similar soils: 30 percent  
 Colskel and similar soils: 20 percent  
 Minor components: 15 percent

**Component Descriptions****Arabrab soils**

*Landform:* Structural benches  
*Parent material:* Sandstone residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 5 percent gravel, about 5 percent cobbles  
*Depth to restrictive feature:* 6 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 2.7 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

**Typical Profile:**

A—0 to 2 inches; sandy loam  
 Bw—2 to 7 inches; loam  
 Bt—7 to 16 inches; clay loam  
 R—16 inches; bedrock

**Vessilla soils**

*Landform:* Structural benches  
*Parent material:* Eolian sand, sandstone residuum  
*Slope:* 2 to 15 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 1.8 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea,

Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 6 inches; loamy sand  
C1—6 to 15 inches; sandy loam  
C2—15 to 19 inches; sandy loam  
R—19 inches; bedrock

**Colskel soils**

*Landform:* Structural benches

*Parent material:* Colluvium, residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 20 percent gravel, about 10 percent cobbles, about 10 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.9 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; gravelly sandy loam  
C—4 to 10 inches; very gravelly loam  
R—10 inches; bedrock

**Minor Components**

Straight Cliffs and Dakota Formation Badland

*Composition:* About 8 percent

*Landform:* Structural benches

Sili and similar soils

*Composition:* About 5 percent

*Landform:* Small alluvial flats on structural benches

*Drainage class:* Well drained

*Ecological site:* Upland Loam (Mountain Big Sagebrush)

Ustipsamments and similar soils

*Composition:* About 2 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)

*Drainage class:* Excessively well drained

**5079—Colskel-Arabrab-Vessilla complex,  
15 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 6,300 to 7,800 feet (1,921 to 2,378 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located southeast of the town of Escalante, occurs along drainages on the Kaiparowits Plateau and around the town of Cannonville. Also located southeast of the town of Cannonville, along the Cockscomb around Round Valley and along Lower Podunk Creek.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Drip Tank Member (Ksd); Straight Cliffs Formation, Lower Member (Ksl)

**Map Unit Composition**

Colskel and similar soils: 40 percent

Arabrab and similar soils: 25 percent

Vessilla and similar soils: 20 percent

Minor components: 15 percent

**Component Descriptions**

**Colskel soils**

*Landform:* Structural benches

*Parent material:* Colluvium, residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 20 percent gravel, about 10 percent cobbles, about 10 percent flagstones, about 10 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.7 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 7 inches; very gravelly loam  
 C—7 to 18 inches; very gravelly loam  
 R—18 inches; bedrock

**Arabrab soils**

*Landform:* Structural benches

*Parent material:* Sandstone residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 5 percent gravel, about 5 percent channers, about 5 percent flagstones

*Depth to restrictive feature:* 6 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 5 inches; fine sandy loam  
 AB—5 to 10 inches; loam  
 Bt—10 to 19 inches; clay loam  
 R—19 inches; bedrock

**Vessilla soils**

*Landform:* Structural benches

*Parent material:* Sandstone residuum, eolian sand

*Slope:* 15 to 50 percent

*Surface fragments:* About 15 percent gravel, about 5 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.6 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 2 inches; gravelly loamy sand  
 C—2 to 8 inches; gravelly sandy loam  
 R—8 inches; bedrock

**Minor Components**

Straight Cliffs Formation Rock outcrop

*Composition:* About 10 percent

*Landform:* Escarpments and structural benches

Ustipsamments and similar soils

*Composition:* About 5 percent

*Landform:* Scarps on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Excessively well drained

**5080—Moffat-Moepitz complex, 2 to 25 percent slopes**

**Map Unit Setting**

*Elevation:* 4,500 to 5,200 feet (1,372 to 1,585 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, occurring in drainages along the escarpment of Fiftymile Bench.

*Geology:* Entrada Sandstone (Je)

### Map Unit Composition

Moffat and similar soils: 55 percent  
 Moepitz and similar soils: 30 percent  
 Minor components: 15 percent

### Component Descriptions

#### Moffat soils

*Landform:* Plains on structural benches  
*Parent material:* Eolian sand, alluvium  
*Slope:* 2 to 15 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 6.5 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 20 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sandy Loam (Blackbrush)  
*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 5 inches; sandy loam  
 Bw—5 to 17 inches; sandy loam  
 Bk1—17 to 29 inches; sandy loam  
 Bk2—29 to 60 inches; sandy loam

#### Moepitz soils

*Landform:* Hillslopes on structural benches, breaks  
*Parent material:* Mixed alluvium, eolian sand  
*Slope:* 2 to 25 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 3.7 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sandy Loam (Blackbrush)  
*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 7 inches; sandy loam  
 C—7 to 34 inches; sandy loam  
 R—34 inches; bedrock

### Minor Components

Typic Torrfluvents and similar soils

*Composition:* About 8 percent  
*Landform:* Washes  
*Drainage class:* Well drained

Needle and similar soils

*Composition:* About 5 percent  
*Landform:* Sand sheets on structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Excessively drained  
*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)

Entrada Sandstone Rock outcrop

*Composition:* About 2 percent  
*Landform:* Slickrock on structural benches

### 5081—Badland and Rock outcrop (Straight Cliffs and Wahweap Formations)-Kydestea family complex, 50 to 80 percent slopes

#### Map Unit Setting

*Elevation:* 6,900 to 7,900 feet (2,104 to 2,409 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, on Fiftymile Mountain.  
*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Wahweap Formation, Lower Member (Kwl); Straight Cliffs Formation, Drip Tank Member (Ksd); Wahweap Formation, Upper Member (Kwu)

#### Map Unit Composition

Straight Cliffs and Wahweap Formation Badland: 40 percent  
 Straight Cliffs and Wahweap Formation Rock outcrop: 30 percent  
 Kydestea family and similar soils: 15 percent  
 Minor components: 15 percent

### Component Descriptions

#### Straight Cliffs and Wahweap Formation Badland

*Landform:* Escarpments  
*Slope:* 60 to 140 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

#### Straight Cliffs and Wahweap Formation Rock outcrop

*Landform:* Cliffs on escarpments  
*Slope:* 60 to 140 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

#### Kydestea family soils

*Landform:* Ledges on escarpments  
*Parent material:* Sandstone residuum, colluvium  
*Slope:* 50 to 80 percent  
*Surface fragments:* About 5 percent gravel, about 5 percent cobbles, about 15 percent stones, about 5 percent boulders  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.5 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Very Steep Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* Utah juniper, twoneedle pinyon, Indian ricegrass, Utah serviceberry, Mexican cliffrose, Salina wildrye, alderleaf mountainmahogany, green Mormon tea  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 7 inches; extremely stony loam  
 C—7 to 19 inches; extremely cobbly loam  
 R—19 inches; bedrock

#### Minor Components

Sandy Aridic Ustorthents and similar soils  
*Composition:* About 8 percent  
*Landform:* Ledges on escarpments  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
 Menefee family, steep and similar soils

*Composition:* About 7 percent  
*Landform:* Dissected structural benches  
*Depth to restrictive feature:* 8 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Very Steep Shallow Loam (Pinyon-Utah Juniper)

### 5082—Colskel-Menefee-Arabrab complex, 2 to 15 percent slopes

#### Map Unit Setting

*Elevation:* 6,000 to 7,200 feet (1,829 to 2,195 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located south of the town of Escalante, on benches in the Pete's Cove area of the Kaiparowits Plateau and south of the town of Cannonville at the mouth of Bulldog Hollow.  
*Geology:* Wahweap Formation, Lower Member (Kwl); Straight Cliffs Formation, Drip Tank Member (Ksd); Wahweap Formation, Upper Member (Kwu)

#### Map Unit Composition

Colskel and similar soils: 45 percent  
 Menefee and similar soils: 25 percent  
 Arabrab and similar soils: 20 percent  
 Minor components: 10 percent

#### Component Descriptions

##### Colskel soils

*Landform:* Structural benches  
*Parent material:* Residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 15 percent gravel, about 5 percent cobbles  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.5 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 3 inches; gravelly loam  
C1—3 to 7 inches; very gravelly loam  
C2—7 to 14 inches; very gravelly loam  
R—14 inches; bedrock

**Menefee soils**

*Landform:* Dissected structural benches, hillslopes

*Parent material:* Residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 15 percent gravel, about 10 percent cobbles, about 10 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 0.7 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 2 percent

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 8 inches; gravelly clay loam  
Cr1—8 to 13 inches; weathered bedrock  
Cr2—13 inches; weathered bedrock

**Arabrab soils**

*Landform:* Structural benches

*Parent material:* Sandstone residuum

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 6 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.7 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; sandy loam  
AB—4 to 9 inches; loam  
Bt—9 to 17 inches; sandy clay loam  
R—17 inches; bedrock

**Minor Components**

Ustorthents and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)

*Drainage class:* Well drained

Wahweap Formation Rock outcrop

*Composition:* About 5 percent

*Landform:* Structural benches

**5083—Colskel-Menefee complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 5,600 to 7,000 feet (1,707 to 2,134 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located south of the town of Escalante, in drainages near Window Sash Bench, Death Ridge, and Pete's Cove on the Kaiparowits Plateau.

*Geology:* Wahweap Formation, Lower Member (Kwl);

Wahweap Formation, Upper Member (Kwu);

Straight Cliffs Formation, John Henry Member

(Ksj)

**Map Unit Composition**

Colskel and similar soils: 45 percent

Menefee and similar soils: 40 percent

Minor components: 15 percent

## Component Descriptions

### Colskel soils

*Landform:* Dissected structural benches

*Parent material:* Residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 25 percent gravel, about 10 percent cobbles, about 10 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.7 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 2 inches; very gravelly sandy loam

C—2 to 8 inches; very gravelly loam

R—8 inches; bedrock

### Menefee soils

*Landform:* Ledges on escarpments, hillslopes

*Parent material:* Residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 30 percent gravel

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.9 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 2 percent

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea,

Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 3 inches; gravelly loam

Bw—3 to 8 inches; loam

Cr—8 to 20 inches; weathered bedrock

### Minor Components

Wahweap Formation Rock outcrop

*Composition:* About 8 percent

*Landform:* Escarpments

Lithic Haplustalfs and similar soils

*Composition:* About 4 percent

*Landform:* Escarpments

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

Aridic Ustorthents and similar soils

*Composition:* About 3 percent

*Landform:* Escarpments

*Drainage class:* Well drained

## 5085—Hillburn very channery loam, 10 to 70 percent slopes

### Map Unit Setting

*Elevation:* 5,200 to 6,200 feet (1,585 to 1,890 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located northeast of the town of Big Water in the burning hills area of the Kaiparowits Plateau.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Drip Tank Member (Ksd)

### Map Unit Composition

Hillburn and similar soils: 75 percent

Minor components: 25 percent

### Component Descriptions

#### Hillburn soils

*Landform:* Hillslopes

*Parent material:* Burnt sandstone and shale residuum and colluvium

*Slope:* 10 to 70 percent

*Surface fragments:* About 5 percent gravel, about 10 percent cobbles, about 10 percent channers, about 10 percent flagstones, about 10 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 2 inches; very channery loam

C1—2 to 7 inches; very flaggy loam

C2—7 to 13 inches; very channery loam

R—13 inches; bedrock

**Minor Components**

Straight Cliffs Formation Burnt Sandstone Rock outcrop

*Composition:* About 10 percent

*Landform:* Hills

Hillburn family and similar soils

*Composition:* About 10 percent

*Landform:* Rolling hills

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

Fluvents and similar soils

*Composition:* About 5 percent

*Landform:* Channels

*Drainage class:* Somewhat poorly drained

**5086—Mespun-Bispen-Santrick complex,  
2 to 15 percent slopes**

**Map Unit Setting**

*Elevation:* 5,600 to 6,700 feet (1,707 to 2,043 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located northeast of the town of Escalante, on sandy benches along the Calf Creek and Escalante River drainages and east of the town of Paria near the confluence of Paria River and Cottonwood Creek.

*Geology:* Navajo Sandstone (Jn); with minor amounts of Kayenta Formation, main body (Jk)

**Map Unit Composition**

Mespun and similar soils: 45 percent

Bispen and similar soils: 25 percent

Santrick and similar soils: 20 percent

Minor components: 10 percent

**Component Descriptions**

**Mespun soils**

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 15 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 4 inches; fine sand

C1—4 to 41 inches; fine sand

C2—41 to 60 inches; fine sand

**Bispen soils**

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 3.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0  
(nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 4 inches; fine sand

C—4 to 52 inches; fine sand

R—52 inches; bedrock

### Santrick soils

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock  
(lithic)

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.4 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Indian ricegrass, needleandthread, Wyoming big sagebrush, fourwing saltbush, galleta, green Mormon tea

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

C1—0 to 3 inches; fine sand

C2—3 to 24 inches; fine sand

R—24 inches; bedrock

### Minor Components

Nalcase and similar soils

*Composition:* About 5 percent

*Landform:* Sand sheets on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Semidesert Shallow Sand (Cutler Mormon tea)

Navajo Sandstone Rock outcrop

*Composition:* About 5 percent

*Landform:* Slickrock on structural benches

## 5087—Kenzo, steep-Rock outcrop (Kayenta Formation) complex, 15 to 50 percent slopes

### Map Unit Setting

*Elevation:* 5,000 to 6,500 feet (1,524 to 1,982 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 54 degrees F (10.0 to 12.0 degrees C)

*Frost-free period:* 140 to 180 days

*Note:* Located east of the town of Boulder, along the Burr Trail, on King and Steep Creek Benches and east of the town of Kanab along the Vermillion Cliffs.

*Geology:* Kayenta Formation, main body (Jk); Moenave Formation (Jmo); Kayenta Formation, Lamb Point Tongue of the Navajo Sandstone (Jnl); Wingate Sandstone (Jw); with minor amounts of Navajo Sandstone (Jn)

### Map Unit Composition

Kenzo, steep and similar soils: 60 percent

Kayenta Formation Rock outcrop: 25 percent

Minor components: 15 percent

### Component Descriptions

#### Kenzo, steep soils

*Landform:* Escarpments on structural benches

*Parent material:* Eolian sand, residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 10 percent gravel, about 5 percent cobbles, about 3 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.8 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Steep Shallow Loam (Utah  
 Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah  
 serviceberry, roundleaf buffaloberry, Indian  
 ricegrass, twoneedle pinyon, broom snakeweed,  
 galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; cobbly loamy sand  
 C—4 to 11 inches; cobbly sandy loam  
 R—11 inches; bedrock

**Kayenta Formation Rock outcrop**

*Landform:* Escarpments and structural benches

*Slope:* 60 to 100 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Simel and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Shale (Utah  
 Juniper-Pinyon)

Arches family and similar soils

*Composition:* About 5 percent

*Landform:* Small sand sheets on structural  
 benches

*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Sand (Utah  
 Juniper-Pinyon)

Kenzo family and similar soils

*Composition:* About 3 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Loam (Utah  
 Juniper-Pinyon)

Ustic Haplargids and similar soils

*Composition:* About 2 percent

*Landform:* Structural benches

*Drainage class:* Well drained

**5088—Calcree-Bowington-Mespu  
 complex, 0 to 20 percent slopes**

**Map Unit Setting**

*Elevation:* 4,800 to 5,800 feet (1,463 to 1,768 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305  
 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0  
 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located near the town of Escalante, along the  
 drainage bottom of Calf Creek and other tributaries  
 of the Escalante River.

*Geology:* Navajo Sandstone (Jn); Wingate Sandstone  
 (Jw); Kayenta Formation, main body (Jk)

**Map Unit Composition**

Calcree and similar soils: 50 percent

Bowington and similar soils: 25 percent

Mespu and similar soils: 20 percent

Minor components: 5 percent

**Component Descriptions**

**Calcree soils**

*Landform:* Stream bottoms and stream terraces

*Parent material:* Alluvium

*Slope:* 0 to 4 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock  
 (lithic)

*Drainage class:* Poorly drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 1.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Ponding hazard:* Rare

*Runoff class:* High

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semiwet Fresh Meadow

*Potential native vegetation:* Kentucky bluegrass,  
 sedge, Baltic rush, basin wildrye, common  
 dandelion, creeping bentgrass, field horsetail,  
 plantain, western wheatgrass

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 8 inches; fine sand

- C1—8 to 15 inches; fine sand
- C2—15 to 27 inches; fine sand
- R—27 inches; bedrock

### **Bowington soils**

*Landform:* Stream terraces  
*Parent material:* Alluvium  
*Slope:* 0 to 5 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Greater than 20 in/hr (very rapid)  
*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Flooding hazard:* Very Rare  
*Runoff class:* Negligible  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semiwet Fresh Streambank (Fremont Cottonwood)  
*Potential native vegetation:* Montana Wheatgrass, coyote willow, rubber rabbitbrush, yellow willow, Fremont cottonwood, Kentucky bluegrass, Louisiana sagewort, Sandberg bluegrass, basin big sagebrush, basin wildrye, western wheatgrass  
*Land capability subclass (nonirrigated):* 6w

#### *Typical Profile:*

- A—0 to 16 inches; fine sand
- C1—16 to 46 inches; fine sand
- C2—46 to 60 inches; fine sand

### **Mespu soils**

*Landform:* Sand sheets  
*Parent material:* Eolian sand  
*Slope:* 0 to 20 percent  
*Drainage class:* Excessively drained  
*Slowest permeability:* Greater than 20 in/hr (very rapid)  
*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush  
*Land capability subclass (nonirrigated):* 5c

#### *Typical Profile:*

- A—0 to 2 inches; fine sand

- C—2 to 60 inches; fine sand

### **Minor Components**

#### Riverwash

*Composition:* About 5 percent  
*Landform:* Stream channels  
*Drainage class:* Poorly drained  
*Flooding hazard:* Very Frequent

## **5089—Bowington-Mespu complex, 0 to 15 percent slopes**

### **Map Unit Setting**

*Elevation:* 4,800 to 5,800 feet (1,463 to 1,768 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located near the town of Escalante, along riparian areas of the Escalante River.  
*Geology:* Navajo Sandstone (Jn); Kayenta Formation, main body (Jk)

### **Map Unit Composition**

Bowington and similar soils: 45 percent  
 Mespu and similar soils: 30 percent  
 Minor components: 25 percent

### **Component Descriptions**

#### **Bowington soils**

*Landform:* Stream terraces  
*Parent material:* Alluvium  
*Slope:* 0 to 5 percent  
*Surface fragments:* About 1 percent gravel, about 1 percent cobbles  
*Drainage class:* Moderately well drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 4.2 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Flooding hazard:* Very Rare  
*Runoff class:* Negligible  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semiwet Fresh Streambank (Fremont Cottonwood)  
*Potential native vegetation:* Montana Wheatgrass, coyote willow, rubber rabbitbrush, yellow willow, Fremont cottonwood, Kentucky bluegrass,

Louisiana sagewort, Sandberg bluegrass, basin big sagebrush, basin wildrye, western wheatgrass

*Land capability subclass (nonirrigated):* 6w

*Typical Profile:*

A—0 to 2 inches; fine sand  
 C1—2 to 37 inches; fine sand  
 C2—37 to 49 inches; fine sand  
 2C1—49 to 60 inches; loamy sand  
 2C2—60 to 62 inches; loamy sand

**Mespuen soils**

*Landform:* Sand sheets

*Parent material:* Eolian sand

*Slope:* 0 to 15 percent

*Surface fragments:* About 2 percent gravel

*Drainage class:* Excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 6 inches; fine sand  
 C1—6 to 11 inches; fine sand  
 C2—11 to 24 inches; fine sand  
 C3—24 to 60 inches; fine sand

**Minor Components**

Calcrete and similar soils

*Composition:* About 13 percent

*Landform:* Stream bottoms

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Poorly drained

*Flooding hazard:* Frequent

*Ecological site:* Semiwet Fresh Meadow

Riverwash

*Composition:* About 12 percent

*Landform:* Stream channels

*Drainage class:* Poorly drained

*Flooding hazard:* Very Frequent

**5090—Baldfield clay, saline, 2 to 8 percent slopes**

**Map Unit Setting**

*Elevation:* 5,000 to 5,600 feet (1,524 to 1,707 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante, along the Hole-in-the-Rock Road, up Left Hand Collet Canyon. Also located around the town of Escalante and southwest of the town of Escalante at the mouth of Alvey Wash.

*Geology:* Tropic Shale (Kt)

**Map Unit Composition**

Baldfield, saline and similar soils: 75 percent

Minor components: 25 percent

**Component Descriptions**

**Baldfield, saline soils**

*Landform:* Valley floors, valley sides

*Parent material:* Shale residuum, alluvium

*Slope:* 2 to 8 percent

*Surface fragments:* About 2 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.6 inches (high)

*Shrink-swell potential:* About 7.5 percent (high)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 10 percent

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 10 (slightly sodic)

*Ecological site:* Alkali Fan (Castlevally Saltbush)

*Potential native vegetation:* valley saltbush, galleta, shadscale, Indian ricegrass, greenmolly, desert trumpet buckwheat

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 2 inches; clay  
 C1—2 to 4 inches; clay  
 C2—4 to 15 inches; clay

C3—15 to 60 inches; clay

### Minor Components

Elias and similar soils

*Composition:* About 14 percent  
*Landform:* valley floors, fan remnants  
*Drainage class:* Well drained  
*Ecological site:* Alkali Flat (Greasewood)

Mikim and similar soils

*Composition:* About 8 percent  
*Landform:* Small alluvial fans on valley sides  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

Henrieville and similar soils

*Composition:* About 2 percent  
*Landform:* fan terraces on valley sides  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

Baldfield family and similar soils

*Composition:* About 1 percent  
*Landform:* Fan terraces on valley sides  
*Drainage class:* Well drained  
*Ecological site:* Loamy Bottom (Basin Big Sagebrush)

## 5091—Brumley fine sandy loam, 2 to 8 percent slopes

### Map Unit Setting

*Elevation:* 6,200 to 7,200 feet (1,890 to 2,195 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located south of the town of Escalante, along the Hole-in-the-Rock Road, near Pete's Cove. Also located west of the town of Cannonville on Bulldog Bench and southwest of the town of Cannonville along the Skutumpah Road in Bullrush Hollow.

*Geology:* Wahweap Formation, Lower Member (Kwl); Straight Cliffs Formation, Drip Tank Member (Ksd)

### Map Unit Composition

Brumley and similar soils: 85 percent

Minor components: 15 percent

### Component Descriptions

#### Brumley soils

*Landform:* Fan remnants

*Parent material:* Slope alluvium

*Slope:* 2 to 8 percent

*Surface fragments:* About 2 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.0 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Loam (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass

*Land capability subclass (nonirrigated):* 5c

### Typical Profile:

A—0 to 7 inches; fine sandy loam

Bt—7 to 17 inches; clay loam

Btk—17 to 27 inches; clay loam

Bk1—27 to 44 inches; loam

Bk2—44 to 60 inches; sandy clay loam

### Minor Components

Loamy-skeletal Calcic Haplustalfs and similar soils

*Composition:* About 5 percent

*Landform:* Fan remnants

*Drainage class:* Well drained

Fine-loamy Aridic Ustorthents and similar soils

*Composition:* About 5 percent

*Landform:* Fan remnants

*Drainage class:* Well drained

Sili, cool and similar soils

*Composition:* About 5 percent

*Landform:* Valley bottoms

*Drainage class:* Well drained

*Ecological site:* Upland Clay Loam (Low Sagebrush)

## 5092—Rock outcrop (Navajo Formation)-Navigon complex, 30 to 60 percent slopes

### Map Unit Setting

*Elevation:* 6,200 to 7,200 feet (1,890 to 2,195 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* 1) Navigon soils are formed in eolian sand pockets. Rounded basalt cobbles and stones exist throughout the soil, but don't affect soil formation to significant extent. The basalt clasts are from past volcanic activity on Boulder Mountain and the Aquarius Plateau.

2) Navigon soils are located near the town of Escalante, along the Pine Creek drainage and south of the town of Boulder along Durfey Mesa.

*Geology:* Navajo Sandstone (Jn)

### Map Unit Composition

Navajo Sandstone Rock outcrop: 50 percent

Navigon and similar soils: 35 percent

Minor components: 15 percent

### Component Descriptions

#### Navajo Sandstone Rock outcrop

*Landform:* Slickrock on structural benches and escarpments

*Slope:* 30 to 140 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Navigon soils

*Landform:* Scree slopes on structural benches

*Parent material:* Eolian sand

*Slope:* 30 to 60 percent

*Surface fragments:* About 35 percent gravel, about 20 percent cobbles, about 20 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 0.2 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)

*Potential native vegetation:* Bigelow sagebrush, Utah juniper, roundleaf buffaloberry, Indian ricegrass, Mexican cliffrose, Torrey Mormon tea, Wright birdbeak, broom snakeweed, galleta, rubber rabbitbrush, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 4 inches; extremely stony fine sand

C—4 to 8 inches; very cobbly fine sand

R—8 inches; bedrock

### Minor Components

Nalcase and similar soils

*Composition:* About 10 percent

*Landform:* Sand sheets on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Semidesert Shallow Sand (Cutler Mormon tea)

Santrick and similar soils

*Composition:* About 5 percent

*Landform:* Dunes on structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

## 5093—Robay-Strell complex, 5 to 30 percent slopes

### Map Unit Setting

*Elevation:* 7,200 to 7,800 feet (2,195 to 2,378 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)

*Frost-free period:* 70 to 90 days

*Note:* Located near the town of Escalante, along the Pine Creek drainage.

*Geology:* Navajo Sandstone (Jn)

### Map Unit Composition

Robay and similar soils: 50 percent

Strell and similar soils: 40 percent

Minor components: 10 percent

### Component Descriptions

#### Robay soils

*Landform:* Structural benches

*Parent material:* Eolian sand, sandstone residuum

*Slope:* 5 to 30 percent

*Surface fragments:* About 10 percent gravel, about 35 percent cobbles, about 5 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* Greater than 20 in/hr (very rapid)  
*Available water capacity:* About 0.4 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Mountain Shallow Loam (Ponderosa Pine)  
*Potential native vegetation:* ponderosa pine, greenleaf manzanita, Gambel oak, Indian ricegrass, Sandberg bluegrass, Utah serviceberry, elkweed, muttongrass, sedge  
*Land capability subclass (nonirrigated):* 7s

**Typical Profile:**

A—0 to 3 inches; very cobbly fine sand  
 C—3 to 10 inches; very cobbly fine sand  
 R—10 inches; bedrock

**Strell soils**

*Landform:* Structural benches, hillslopes  
*Parent material:* Eolian sand  
*Slope:* 5 to 30 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 0.8 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Mountain Shallow Loam (Ponderosa Pine)  
*Potential native vegetation:* ponderosa pine, greenleaf manzanita, Gambel oak, Indian ricegrass, Sandberg bluegrass, Utah serviceberry, elkweed, muttongrass, sedge  
*Land capability subclass (nonirrigated):* 7s

**Typical Profile:**

A—0 to 3 inches; loamy fine sand  
 C—3 to 10 inches; fine sand  
 R—10 inches; bedrock

**Minor Components**

Navajo Sandstone Rock outcrop  
*Composition:* About 10 percent  
*Landform:* Slickrock on structural benches and small escarpments

**5094—Aridic Ustorthents-Yatne complex, 15 to 70 percent slopes****Map Unit Setting**

*Elevation:* 6,000 to 7,000 feet (1,829 to 2,134 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located between the towns of Big Water and Escalante, along the Smoky Mountain Road, near Collet Top and Needle Eye point in the Kaiparowits Plateau region.  
*Geology:* Landslide deposits of Wahweap Formation, Lower Member (Kwl)

**Map Unit Composition**

Aridic Ustorthents and similar soils: 50 percent  
 Yatne and similar soils: 40 percent  
 Minor components: 10 percent

**Component Descriptions****Aridic Ustorthents soils**

*Landform:* Landslide deposits on escarpments  
*Parent material:* Colluvium, residuum  
*Slope:* 25 to 70 percent  
*Surface fragments:* About 5 percent cobbles, about 10 percent stones, about 10 percent boulders  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 6.8 inches (moderate)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Steep Stony Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, twoneedle pinyon, roundleaf buffaloberry, Gambel oak, Indian ricegrass, Utah serviceberry, alderleaf mountainmahogany, galleta, grassy rockgoldenrod, green Mormon tea, muttongrass

*Land capability subclass (nonirrigated):* 5s

*Typical Profile:*

A—0 to 7 inches; very bouldery loam  
 AC—7 to 15 inches; stony loam  
 C1—15 to 33 inches; gravelly loam  
 C2—33 to 60 inches; very gravelly clay loam

**Yatne soils**

*Landform:* Landslide deposits on escarpments, hillslopes

*Parent material:* Colluvium, slope alluvium

*Slope:* 15 to 50 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 15 percent stones, about 15 percent boulders

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 6.5 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Steep Stony Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, twoneedle pinyon, roundleaf buffaloberry, Gambel oak, Indian ricegrass, Utah serviceberry, alderleaf mountainmahogany, galleta, grassy rockgoldenrod, green Mormon tea, muttongrass

*Land capability subclass (nonirrigated):* 5s

*Typical Profile:*

A—0 to 6 inches; very bouldery loam  
 Bw—6 to 15 inches; very stony loam  
 Bk1—15 to 27 inches; very stony loam  
 Bk2—27 to 37 inches; cobbly loam  
 2C1—37 to 45 inches; cobbly clay loam  
 2C2—45 to 60 inches; very stony loam

**Minor Components**

Lithic Ustorthents and similar soils

*Composition:* About 10 percent

*Landform:* Landslide deposits on escarpments

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

**5095—Daklos-Hideout-Rock outcrop (Straight Cliffs Formation) complex, 2 to 15 percent slopes**

**Map Unit Setting**

*Elevation:* 4,800 to 6,700 feet (1,463 to 2,043 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located south of the town of Escalante near Alvey Wash, and northeast of the town of Bigwater, on Tibbits Bench and Smoky Mountain.

*Geology:* Straight Cliffs Formation, Drip Tank Member (Ksd); Straight Cliffs Formation, John Henry Member (Ksj)

**Map Unit Composition**

Daklos and similar soils: 40 percent

Hideout and similar soils: 35 percent

Straight Cliffs Formation Sandstone Rock outcrop: 15 percent

Minor components: 10 percent

**Component Descriptions**

**Daklos soils**

*Landform:* Structural benches

*Parent material:* residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

- A1—0 to 2 inches; sandy loam
- A2—2 to 6 inches; very gravelly loam
- C—6 to 13 inches; very cobbly loam
- R—13 inches; bedrock

**Hideout soils**

*Landform:* Structural benches, hillslopes

*Parent material:* Eolian sand

*Slope:* 2 to 15 percent

*Surface fragments:* About 30 percent gravel, about 5 percent cobbles, about 5 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.5 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

- A—0 to 3 inches; gravelly sandy loam
- C—3 to 6 inches; gravelly sandy loam
- Cr—6 to 9 inches; weathered bedrock
- R—9 inches; bedrock

**Straight Cliffs Formation Sandstone Rock outcrop**

*Landform:* Structural benches

*Slope:* 2 to 15 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Sanostee, warm and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Spiny Hopsage)

Ustic Torripsamments and similar soils

*Composition:* About 5 percent

*Landform:* Small sand sheets on structural benches

*Drainage class:* Somewhat excessively drained

**5096—Daklos, steep-Rock outcrop (Straight Cliffs Formation) complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 5,900 to 6,900 feet (1,799 to 2,104 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located south of the town of Escalante along Alvey Wash, southeast of the town of Henrieville along Horse Valley, and northeast of the town of Bigwater on Tibbits Bench and Smoky Mountain.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Drip Tank Member (Ksd)

**Map Unit Composition**

Daklos, steep and similar soils: 70 percent

Straight Cliffs Formation Sandstone Rock outcrop: 15 percent

Minor components: 15 percent

**Component Descriptions**

**Daklos, steep soils**

*Landform:* Hillslopes on dissected structural benches

*Parent material:* Slope alluvium, residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 40 percent gravel, about 10 percent cobbles, about 10 percent flagstones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.9 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; very gravelly sandy loam  
 C—4 to 11 inches; very gravelly loam  
 R—11 inches; bedrock

### **Straight Cliffs Formation Sandstone Rock outcrop**

*Landform:* Escarpments and structural benches

*Slope:* 15 to 50 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

### **Minor Components**

Loamy Lithic Ustic Torriorthents and similar soils

*Composition:* About 7 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

Loamy-skeletal shallow Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

Loamy-skeletal Lithic Ustic Haplargids and similar soils

*Composition:* About 3 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

### **5097—Skyvillage-Daklos, saline-Rock outcrop (Wahweap Formation) complex, 2 to 15 percent slopes**

#### **Map Unit Setting**

*Elevation:* 4,800 to 5,400 feet (1,463 to 1,646 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located north of the town of Church Wells, along the Wahweap Creek drainage south of Fourmile Bench, along Cads Crotch and on Jack Riggs Bench.

*Geology:* Straight Cliffs Formation, Drip Tank Member (Ksd); Wahweap Formation, Lower Member (Kwl)

#### **Map Unit Composition**

Skyvillage and similar soils: 60 percent

Daklos, saline and similar soils: 15 percent

Wahweap Formation Rock outcrop: 15 percent

Minor components: 10 percent

#### **Component Descriptions**

##### **Skyvillage soils**

*Landform:* Structural benches

*Parent material:* Sandstone residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 10 percent gravel

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.1 inches (very low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; fine sandy loam

C—3 to 8 inches; loam

Cr—8 to 12 inches; weathered bedrock

R—12 inches; bedrock

##### **Daklos, saline soils**

*Landform:* Structural benches

*Parent material:* Residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 80 percent gravel

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.9 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 4 mmhos/cm (very slightly saline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sandy Loam (Shadscale)  
*Potential native vegetation:* galleta, shadscale, Cutler Mormon tea, Bigelow sagebrush, Indian ricegrass, broom snakeweed, needleandthread  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; very gravelly loam  
 C—3 to 11 inches; extremely gravelly loam  
 R—11 inches; bedrock

**Wahweap Formation Rock outcrop**

*Landform:* Structural benches  
*Slope:* 2 to 40 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

**Minor Components**

Lithic Torripsamments and similar soils  
*Composition:* About 10 percent  
*Landform:* Small sand sheets on structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained

**5098—Daklos, saline-Skyvillage, saline-Cannonville complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 4,800 to 5,800 feet (1,463 to 1,768 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located northeast of the town of Big Water, near Tibbet Bench and Smoky Mountain. Also located northeast of the town of Tropic on Walt Bench and southeast of the town of Henrieville near Wiggler Wash.  
*Geology:* Wahweap Formation, Lower Member (Kwl); Straight Cliffs Formation, Drip Tank Member (Ksd)

**Map Unit Composition**

Daklos, saline and similar soils: 40 percent  
 Skyvillage, saline and similar soils: 30 percent  
 Cannonville and similar soils: 15 percent  
 Minor components: 15 percent

**Component Descriptions**

**Daklos, saline soils**

*Landform:* Structural benches  
*Parent material:* Slope alluvium, residuum  
*Slope:* 15 to 50 percent  
*Surface fragments:* About 50 percent gravel  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.8 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 4 mmhos/cm (very slightly saline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sandy Loam (Shadscale)  
*Potential native vegetation:* galleta, shadscale, Cutler Mormon tea, Bigelow sagebrush, Indian ricegrass, broom snakeweed, needleandthread  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 5 inches; gravelly sandy loam  
 C—5 to 10 inches; very gravelly sandy loam  
 R—10 inches; bedrock

**Skyvillage, saline soils**

*Landform:* Structural benches  
*Parent material:* Slope alluvium, sandstone residuum  
*Slope:* 15 to 50 percent  
*Surface fragments:* About 15 percent gravel  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.6 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 4 mmhos/cm (very slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Sandy Loam (Shadscale)

*Potential native vegetation:* galleta, shadscale, Cutler Mormon tea, Bigelow sagebrush, Indian ricegrass, broom snakeweed, needleandthread

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 2 inches; gravelly sandy loam

C—2 to 7 inches; very gravelly sandy loam

R—7 inches; bedrock

### **Cannonville soils**

*Landform:* Hillslopes

*Parent material:* Shale residuum

*Slope:* 15 to 50 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 2.1 inches (very low)

*Shrink-swell potential:* About 6.5 percent (high)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)

*Potential native vegetation:* Indian ricegrass, galleta, roundleaf buffaloberry, shadscale, bottlebrush squirreltail, Utah juniper, black sagebrush, crispleaf buckwheat

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; clay

C—4 to 11 inches; clay

Cr—11 inches; weathered bedrock

### **Minor Components**

Wahweap Formation Rock outcrop

*Composition:* About 10 percent

*Landform:* Structural benches

Wahweap Formation Badland

*Composition:* About 5 percent

*Landform:* Escarpments and breaks

## **5100—Rock outcrop (Wingate Formation)-Arches, dry complex, 2 to 10 percent slopes**

### **Map Unit Setting**

*Elevation:* 6,000 to 7,000 feet (1,829 to 2,134 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area.

*Geology:* Wingate Sandstone (Jw); with minor amounts of Kayenta Formation, main body (Jk); and Chinle Formation, Church Rock, Owl Rock, Petrified Forest, and Monitor Butte Members (TRc)

### **Map Unit Composition**

Wingate Formation Rock outcrop: 75 percent

Arches, dry and similar soils: 25 percent

### **Component Descriptions**

#### **Wingate Formation Rock outcrop**

*Landform:* Cliffs

*Slope:* 5 to 200 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### **Arches, dry soils**

*Landform:* Sand pockets

*Parent material:* Eolian sand

*Slope:* 2 to 10 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.8 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 8 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)

*Potential native vegetation:* Bigelow sagebrush, Utah

juniper, roundleaf buffaloberry, Indian ricegrass, Mexican cliffrose, Torrey Mormon tea, Wright birdbeak, broom snakeweed, galleta, rubber rabbitbrush, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 1 inch; fine sand  
C—1 to 7 inches; fine sandy loam  
Cr—7 to 8 inches; weathered bedrock  
R—8 inches; bedrock

**5101—Polychrome family-Badland (Chinle Formation)-Gaddes family complex, 15 to 60 percent slopes**

**Map Unit Setting**

*Elevation:* 5,500 to 6,500 feet (1,677 to 1,982 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area.

*Geology:* Chinle Formation, Church Rock, Owl Rock, Petrified Forest, and Monitor Butte Members (TRc); Wingate Sandstone (Jw)

**Map Unit Composition**

Polychrome family and similar soils: 50 percent

Chinle Formation Badland: 20 percent

Gaddes family and similar soils: 15 percent

Minor components: 15 percent

**Component Descriptions**

**Polychrome family soils**

*Landform:* Escarpments

*Parent material:* Slope alluvium, colluvium

*Slope:* 15 to 60 percent

*Surface fragments:* About 15 percent gravel, about 15 percent cobbles, about 5 percent channers, about 30 percent stones, about 15 percent boulders

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 0.9 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 4 mmhos/cm (very slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Indian ricegrass, Utah juniper, galleta, green Mormon tea, roundleaf buffaloberry, Wyoming big sagebrush, broom snakeweed, needleandthread, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 18 inches; extremely stony very fine sand

C—18 to 31 inches; extremely cobbly fine sandy loam

Cr—31 inches; weathered bedrock

**Chinle Formation Badland**

*Slope:* 10 to 100 percent

*Runoff class:* Very high

*Salinity maximum:* About 30 mmhos/cm (strongly saline)

*Land capability subclass (nonirrigated):* 8

**Gaddes family soils**

*Landform:* Escarpments

*Parent material:* Colluvium over residuum

*Slope:* 15 to 60 percent

*Surface fragments:* About 20 percent gravel, about 10 percent cobbles, about 5 percent channers, about 35 percent stones, about 20 percent boulders

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 4.2 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 5s

*Typical Profile:*

A—0 to 1 inch; extremely bouldery loam

Bw—1 to 18 inches; very gravelly loam  
 2Bt—18 to 32 inches; clay loam  
 2Cr—32 inches; weathered bedrock

### Minor Components

Sandy-skeletal Lithic Ustic Torriorthents and similar soils

*Composition:* About 10 percent

*Landform:* Escarpments

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

Riverwash

*Composition:* About 3 percent

*Landform:* Washes

*Drainage class:* Well drained

*Flooding hazard:* Rare

Ustic Calcicargids and similar soils

*Composition:* About 2 percent

*Landform:* Escarpments

*Drainage class:* Well drained

## 5102—Chinchin-Badland (Chinle Formation) complex, 25 to 50 percent slopes

### Map Unit Setting

*Elevation:* 5,100 to 6,900 feet (1,555 to 2,104 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area and near the town of Paria along the Paria River.

*Geology:* Chinle Formation, Church Rock, Owl Rock, Petrified Forest, and Monitor Butte Members (TRc); Chinle Formation, Shinarump Member (TRcs)

### Map Unit Composition

Chinchin and similar soils: 45 percent

Chinle Formation Badland: 40 percent

Minor components: 15 percent

### Component Descriptions

#### Chinchin soils

*Landform:* Escarpments and hillslopes on structural benches

*Parent material:* Residuum, colluvium

*Slope:* 25 to 50 percent

*Surface fragments:* About 70 percent gravel, about 5 percent cobbles, about 5 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 1.7 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)

*Potential native vegetation:* Indian ricegrass, galleta, roundleaf buffaloberry, shadscale, bottlebrush squirreltail, Utah juniper, black sagebrush, crispleaf buckwheat

*Land capability subclass (nonirrigated):* 7s

### Typical Profile:

A—0 to 4 inches; gravelly loam

Btk—4 to 10 inches; clay loam

R—10 inches; bedrock

### Chinle Formation Badland

*Slope:* 25 to 75 percent

*Runoff class:* Very high

*Salinity maximum:* About 30 mmhos/cm (strongly saline)

*Land capability subclass (nonirrigated):* 8

### Minor Components

Vertic Natrargids and similar soils

*Composition:* About 10 percent

*Landform:* Hillsides

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

Loamy Lithic Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Hillsides

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

## 5103—Barx-Remorris complex, 5 to 45 percent slopes

### Map Unit Setting

*Elevation:* 5,300 to 6,800 feet (1,616 to 2,073 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area.

*Geology:* Chinle Formation, Church Rock, Owl Rock, Petrified Forest, Monitor Butte Members (TRc); Chinle Formation, Shinarump Member (TRcs); Moenkopi Formation (TRm)

#### Map Unit Composition

Barx and similar soils: 55 percent

Remorris and similar soils: 20 percent

Minor components: 25 percent

#### Component Descriptions

##### Barx soils

*Landform:* Alluvial flats

*Parent material:* Reworked eolian material, alluvium

*Slope:* 5 to 15 percent

*Surface fragments:* About 2 percent channers

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.8 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 40 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

##### Typical Profile:

A—0 to 3 inches; fine sandy loam

Bw—3 to 9 inches; sandy loam

Bt—9 to 28 inches; sandy clay loam

Btk—28 to 35 inches; loam

Bk—35 to 60 inches; silt loam

##### Remorris soils

*Landform:* Structural benches

*Parent material:* Residuum

*Slope:* 25 to 45 percent

*Surface fragments:* About 45 percent gravel, about 35 percent channers

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.9 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 20 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 7s

##### Typical Profile:

A—0 to 1 inch; extremely gravelly loam

C—1 to 6 inches; loam

Cr1—6 to 9 inches; weathered bedrock

Cr2—9 inches; bedrock

##### Minor Components

Lithic Ustic Haplargids and similar soils

*Composition:* About 10 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

Chinle Formation Badland

*Composition:* About 10 percent

*Landform:* Hillslopes

Ustic Haplocalcids and similar soils

*Composition:* About 5 percent

*Landform:* Alluvial flats

*Drainage class:* Well drained

### 5104—Rock outcrop (Shinarump Conglomerate)-Hideout complex, 5 to 50 percent slopes

#### Map Unit Setting

*Elevation:* 5,400 to 6,500 feet (1,646 to 1,982 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area.

*Geology:* Chinle Formation, Church Rock, Owl Rock, Petrified Forest, and Monitor Butte Members (TRc); Chinle Formation, Shinarump Member (TRcs); Moenkopi Formation (TRm)

#### Map Unit Composition

Shinarump Member, Chinle Formation Rock outcrop: 75 percent

Hideout and similar soils: 15 percent

Minor components: 10 percent

#### Component Descriptions

##### Shinarump Member, Chinle Formation Rock outcrop

*Landform:* Structural benches

*Slope:* 5 to 100 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

##### Hideout soils

*Landform:* Structural benches, hillslopes

*Parent material:* Eolian sand, residuum

*Slope:* 5 to 50 percent

*Surface fragments:* About 50 percent channers, about 25 percent flagstones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.5 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

##### Typical Profile:

A1—0 to 1 inch; extremely channery loamy sand

A2—1 to 5 inches; sandy loam

Cr—5 to 9 inches; weathered bedrock

R—9 inches; bedrock

#### Minor Components

Sandy Lithic Ustic Torriorthent and similar soils

*Composition:* About 10 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Excessively drained

#### 5105—Atchee-Lazear, dry-Rock outcrop (Shinarump Conglomerate) complex, 5 to 60 percent slopes

##### Map Unit Setting

*Elevation:* 5,300 to 6,500 feet (1,616 to 1,982 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area and southwest of the town of Paria near Calico Peak.

*Geology:* Chinle Formation, Shinarump Member (TRcs); Chinle Formation, Church Rock, Owl Rock, Petrified Forest, and Monitor Butte Members (TRc); Moenkopi Formation (TRm)

##### Map Unit Composition

Atchee and similar soils: 40 percent

Lazear, dry and similar soils: 35 percent

Shinarump Member, Chinle Formation Rock outcrop: 15 percent

Minor components: 10 percent

##### Component Descriptions

##### Atchee soils

*Landform:* Dissected structural benches

*Parent material:* Colluvium and slope alluvium over residuum

*Slope:* 5 to 60 percent

*Surface fragments:* About 30 percent gravel, about 10 percent channers, about 10 percent flagstones, about 10 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.8 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah  
 Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom  
 snakeweed, green Mormon tea, Fremont's  
 mahonia, Indian ricegrass, galleta, roundleaf  
 buffaloberry, twoneedle pinyon, yellow  
 rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 1 inch; extremely gravelly loamy fine sand  
 Bw—1 to 4 inches; very gravelly fine sandy loam  
 C—4 to 12 inches; extremely gravelly fine sandy  
 loam  
 2Cr—12 to 15 inches; weathered bedrock  
 R—15 inches; bedrock

**Lazear, dry soils**

*Landform:* Hillslopes on dissected structural benches  
*Parent material:* Residuum  
*Slope:* 5 to 60 percent  
*Surface fragments:* About 40 percent gravel, about 10  
 percent cobbles, about 15 percent channers  
*Depth to restrictive feature:* 10 to 20 inches to bedrock  
 (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 0.7 inch (very low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah  
 Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom  
 snakeweed, green Mormon tea, Fremont's  
 mahonia, Indian ricegrass, galleta, roundleaf  
 buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; clay loam  
 Cr—4 to 15 inches; weathered bedrock  
 R—15 inches; bedrock

**Shinarump Member, Chinle Formation Rock outcrop**

*Landform:* Dissected structural benches  
*Slope:* 5 to 150 percent

*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

**Minor Components**

Lithic Ustic Haplocalcids and similar soils  
*Composition:* About 10 percent  
*Landform:* Dissected structural benches  
*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)  
*Drainage class:* Well drained

**5106—Hillburn, dry-Badland (Moenkopi Formation) complex, 25 to 60 percent slopes****Map Unit Setting**

*Elevation:* 5,200 to 7,200 feet (1,585 to 2,195 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305  
 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0  
 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located east of the town of Boulder, along the  
 Burr Trail Road, in the Circle Cliffs area and south  
 of the town of Paria near Pilot Ridge.  
*Geology:* Chinle Formation, Shinarump Member  
 (TRcs); Moenkopi Formation (TRm); Moenkopi  
 Formation, Middle Red Member (TRmm);  
 Moenkopi Formation, Shnabkaib Member (TRms)

**Map Unit Composition**

Hillburn, dry and similar soils: 60 percent  
 Moenkopi Formation Badland: 35 percent  
 Minor components: 5 percent

**Component Descriptions****Hillburn, dry soils**

*Landform:* Escarpments on dissected structural  
 benches  
*Parent material:* Sandstone and shale residuum and  
 colluvium  
*Slope:* 25 to 60 percent  
*Surface fragments:* About 20 percent gravel, about 10  
 percent cobbles, about 10 percent channers, about  
 15 percent stones, about 40 percent boulders  
*Depth to restrictive feature:* 4 to 20 inches to bedrock  
 (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately  
 slow)  
*Available water capacity:* About 1.3 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high  
*Calcium carbonate maximum:* About 50 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Shale (Utah  
 Juniper-Pinyon)  
*Potential native vegetation:* Fremont's mahonia, Utah  
 juniper, broom snakeweed, galleta, green Mormon  
 tea, Indian ricegrass, Mexican cliffrose, plains  
 pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 2 inches; extremely bouldery loam  
 C1—2 to 7 inches; very gravelly silt loam  
 C2—7 to 15 inches; extremely gravelly silt loam  
 R—15 inches; bedrock

**Moenkopi Formation Badland**

*Slope:* 25 to 170 percent  
*Runoff class:* Very high  
*Gypsum maximum:* About 15 percent  
*Land capability subclass (nonirrigated):* 8

**Minor Components**

Loamy-skeletal Ustic Torriorthents and similar soils  
*Composition:* About 5 percent  
*Landform:* Dissected structural benches  
*Depth to restrictive feature:* 20 to 40 inches to  
 bedrock (lithic)  
*Drainage class:* Well drained

**5107—Simel-Hillburn, dry complex, 5 to 45  
 percent slopes**

**Map Unit Setting**

*Elevation:* 5,000 to 6,800 feet (1,524 to 2,073 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305  
 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0  
 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located east of the town of Boulder, along the  
 Burr Trail Road, in the Circle Cliffs area and south  
 of the town of Paria near Pilot Ridge.  
*Geology:* Moenkopi Formation (TRm)

**Map Unit Composition**

Simel and similar soils: 60 percent  
 Hillburn, dry and similar soils: 30 percent  
 Minor components: 10 percent

**Component Descriptions**

**Simel soils**

*Landform:* Structural benches  
*Parent material:* Residuum, alluvium  
*Slope:* 5 to 45 percent  
*Surface fragments:* About 20 percent gravel, about 30  
 percent channers  
*Depth to restrictive feature:* 4 to 20 inches to bedrock  
 (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 0.7 inch (very low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Shale (Utah  
 Juniper-Pinyon)  
*Potential native vegetation:* Fremont's mahonia, Utah  
 juniper, broom snakeweed, galleta, green Mormon  
 tea, Indian ricegrass, Mexican cliffrose, plains  
 pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 1 inch; very channery silt loam  
 Bw—1 to 4 inches; silt loam  
 Cr1—4 to 6 inches; weathered bedrock  
 Cr2—6 to 13 inches; weathered bedrock  
 R—13 inches; bedrock

**Hillburn, dry soils**

*Landform:* Structural benches  
*Parent material:* Sandstone and shale residuum and  
 colluvium  
*Slope:* 5 to 45 percent  
*Surface fragments:* About 70 percent channers, about  
 5 percent flagstones  
*Depth to restrictive feature:* 4 to 20 inches to bedrock  
 (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately  
 slow)  
*Available water capacity:* About 0.6 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Shale (Utah  
 Juniper-Pinyon)

*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 2 inches; extremely channery clay loam  
 C—2 to 6 inches; extremely flaggy loam  
 R—6 inches; bedrock

**Minor Components**

Loamy-skeletal Ustic Torriorthents and similar soils

*Composition:* About 10 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

**5108—Hillburn, dry-Rock outcrop (Moenkopi Formation) complex, 10 to 60 percent slopes**

**Map Unit Setting**

*Elevation:* 5,500 to 6,800 feet (1,677 to 2,073 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area.

*Geology:* Moenkopi Formation (TRm)

**Map Unit Composition**

Hillburn, dry and similar soils: 60 percent

Moenkopi Formation Rock outcrop: 25 percent

Minor components: 15 percent

**Component Descriptions**

**Hillburn, dry soils**

*Landform:* Structural benches

*Parent material:* Sandstone and shale residuum and colluvium

*Slope:* 10 to 60 percent

*Surface fragments:* About 70 percent channers, about 20 percent flagstones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 0.6 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)

*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 1 inch; extremely channery loam  
 C—1 to 6 inches; very channery silt loam  
 Cr—6 to 9 inches; weathered bedrock  
 R—9 inches; bedrock

**Moenkopi Formation Rock outcrop**

*Landform:* Structural benches

*Slope:* 10 to 60 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Simel and similar soils

*Composition:* About 10 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)

Loamy-skeletal Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

**5109—Nonip, dry-Rock outcrop (Moenkopi Formation) complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 5,800 to 6,900 feet (1,768 to 2,104 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area.

*Geology:* Moenkopi Formation (TRm)

### Map Unit Composition

Nonip, dry and similar soils: 70 percent

Moenkopi Formation Rock outcrop: 20 percent

Minor components: 10 percent

### Component Descriptions

#### Nonip, dry soils

*Landform:* Hillslopes on structural benches

*Parent material:* Siltstone, limestone, and shale residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 20 percent gravel, about 40 percent channers, about 30 percent flagstones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.5 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)

*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A1—0 to 1 inch; extremely channery loam

A2—1 to 3 inches; very gravelly loam

C—3 to 6 inches; very gravelly silt loam

R—6 inches; bedrock

#### Moenkopi Formation Rock outcrop

*Landform:* Structural benches

*Slope:* 15 to 75 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Minor Components

Lazear, steep and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes on dissected structural benches

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

Clayey Lithic Ustic Haplargids and similar soils

*Composition:* About 3 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

Riverwash

*Composition:* About 2 percent

*Landform:* Channels

*Drainage class:* Somewhat poorly drained

*Flooding hazard:* Very Rare

### 5110—Reef very channery sandy loam, 5 to 25 percent slopes

#### Map Unit Setting

*Elevation:* 5,400 to 6,900 feet (1,646 to 2,104 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area.

*Geology:* Moenkopi Formation (TRm)

#### Map Unit Composition

Reef and similar soils: 85 percent

Minor components: 15 percent

#### Component Descriptions

##### Reef soils

*Landform:* Structural benches

*Parent material:* Residuum

*Slope:* 5 to 25 percent

*Surface fragments:* About 20 percent gravel, about 35 percent channers, about 5 percent flagstones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.7 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0  
 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah  
 Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom  
 snakeweed, green Mormon tea, Fremont's  
 mahonia, Indian ricegrass, galleta, roundleaf  
 buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 1 inch; very channery sandy loam  
 C1—1 to 5 inches; extremely gravelly loam  
 C2—5 to 9 inches; extremely channery loam  
 R—9 inches; bedrock

**Minor Components**

Mellenthin and similar soils

*Composition:* About 8 percent  
*Landform:* Dissected hillslopes on structural  
 benches  
*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Loam  
 (Galleta-Utah Juniper)

Loamy Lithic Ustic Haplargids and similar soils

*Composition:* About 5 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)  
*Drainage class:* Well drained

Moenkopi Formation Rock outcrop

*Composition:* About 2 percent  
*Landform:* Structural benches

**5111—Nonip extremely channery sandy  
 loam, dry, 5 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 5,400 to 6,500 feet (1,646 to 1,982 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305  
 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0  
 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located east of the town of Boulder, along the  
 Burr Trail Road, in the Circle Cliffs area.  
*Geology:* Moenkopi Formation (TRm)

**Map Unit Composition**

Nonip, dry and similar soils: 80 percent  
 Minor components: 20 percent

**Component Descriptions**

**Nonip, dry soils**

*Landform:* Hillslopes on structural benches  
*Parent material:* Siltstone, limestone, and shale  
 residuum  
*Slope:* 5 to 50 percent  
*Surface fragments:* About 15 percent gravel, about 55  
 percent channers  
*Depth to restrictive feature:* 4 to 20 inches to bedrock  
 (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)  
*Available water capacity:* About 0.6 inch (very low)  
*Shrink-swell potential:* About 6.5 percent (high)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Shale (Utah  
 Juniper-Pinyon)  
*Potential native vegetation:* Fremont's mahonia, Utah  
 juniper, broom snakeweed, galleta, green Mormon  
 tea, Indian ricegrass, Mexican cliffrose, plains  
 pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A1—0 to 1 inch; extremely channery fine sandy  
 loam  
 A2—1 to 4 inches; channery clay loam  
 C—4 to 7 inches; extremely channery clay  
 R—7 inches; bedrock

**Minor Components**

Loamy-skeletal Lithic Ustic Haplocalcids and similar  
 soils  
*Composition:* About 10 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)  
*Drainage class:* Well drained  
 Loamy Lithic Ustic Haplargids and similar soils  
*Composition:* About 5 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 4 to 20 inches to  
 bedrock (lithic)  
*Drainage class:* Well drained

**Moenkopi Formation Rock outcrop***Composition:* About 5 percent*Landform:* Structural benches**5112—Barx-Radnik, moist-Progresso, dry complex, 2 to 8 percent slopes****Map Unit Setting***Elevation:* 5,100 to 6,600 feet (1,555 to 2,012 meters)*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)*Frost-free period:* 120 to 160 days*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs area. Also located east of the town of Kanab in Fivemile Valley, southeast of the town of Cannonville in Butler Valley, and south of the town of Cannonville near Sheep Creek.*Geology:* Moenkopi Formation (TRm); Entrada Sandstone (Je); Chinle Formation, Church Rock, Owl Rock, Petrified Forest, and Monitor Butte Members (TRc)**Map Unit Composition**

Barx and similar soils: 40 percent

Radnik, moist and similar soils: 25 percent

Progresso, dry and similar soils: 20 percent

Minor components: 15 percent

**Component Descriptions****Barx soils***Landform:* Alluvial flats, stream terrace remnants*Parent material:* Alluvium, reworked eolian material*Slope:* 2 to 8 percent*Drainage class:* Well drained*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)*Available water capacity:* About 9.9 inches (high)*Shrink-swell potential:* About 4.5 percent (moderate)*Runoff class:* Medium*Calcium carbonate maximum:* About 40 percent*Gypsum maximum:* None*Salinity maximum:* About 2 mmhos/cm (nonsaline)*Sodium adsorption ratio maximum:* About 0 (nonsodic)*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat*Land capability subclass (nonirrigated):* 5c*Typical Profile:*

A—0 to 3 inches; fine sandy loam

Btk1—3 to 9 inches; loam

Btk2—9 to 35 inches; loam

Bk—35 to 60 inches; loam

**Radnik, moist soils***Landform:* Stream terrace remnants*Parent material:* Alluvium*Slope:* 2 to 5 percent*Drainage class:* Well drained*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)*Available water capacity:* About 7.6 inches (moderate)*Shrink-swell potential:* About 1.5 percent (low)*Flooding hazard:* Very Rare*Runoff class:* Low*Calcium carbonate maximum:* About 25 percent*Gypsum maximum:* None*Salinity maximum:* About 2 mmhos/cm (nonsaline)*Sodium adsorption ratio maximum:* About 0 (nonsodic)*Ecological site:* Loamy Bottom (Basin Big Sagebrush)*Potential native vegetation:* basin big sagebrush, basin wildrye, Indian ricegrass, rubber rabbitbrush, Sandberg bluegrass, fourwing saltbush, muttongrass, western wheatgrass*Land capability subclass (nonirrigated):* 5c*Typical Profile:*

A—0 to 3 inches; fine sandy loam

C1—3 to 6 inches; loam

C2—6 to 16 inches; fine sandy loam

C3—16 to 18 inches; fine sand

C4—18 to 35 inches; fine sandy loam

C5—35 to 45 inches; loam

C6—45 to 55 inches; loamy fine sand

C7—55 to 60 inches; loam

**Progresso, dry soils***Landform:* Alluvial flats on structural benches*Parent material:* Alluvium*Slope:* 2 to 8 percent*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)*Drainage class:* Well drained*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)*Available water capacity:* About 6.7 inches (moderate)*Shrink-swell potential:* About 4.5 percent (moderate)*Runoff class:* High*Calcium carbonate maximum:* About 30 percent*Gypsum maximum:* None*Salinity maximum:* About 2 mmhos/cm (nonsaline)*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; sandy loam

Bt—3 to 16 inches; clay loam

Bk—16 to 39 inches; sandy clay loam

R—39 inches; bedrock

### Minor Components

**Riverwash**

*Composition:* About 8 percent

*Landform:* Channels

*Drainage class:* Somewhat poorly drained

*Flooding hazard:* Very Rare

**Fine-loamy Ustic Torriorthents and similar soils**

*Composition:* About 4 percent

*Landform:* Stream terrace remnants, alluvial flats

*Drainage class:* Well drained

**Ustic Haplocalcids and similar soils**

*Composition:* About 3 percent

*Landform:* Stream terraces, alluvial flats

*Drainage class:* Well drained

## 5114—Meriwhitica, moist-Mellenthin complex, 5 to 15 percent slopes

### Map Unit Setting

*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Boulder, along the Burr Trail Road, in the Circle Cliffs Area below Wagon Box Mesa.

*Geology:* Moenkopi Formation (TRm)

### Map Unit Composition

Meriwhitica, moist and similar soils: 50 percent

Mellenthin and similar soils: 40 percent

Minor components: 10 percent

### Component Descriptions

#### Meriwhitica, moist soils

*Landform:* Hillslopes on structural benches

*Parent material:* Residuum

*Slope:* 5 to 15 percent

*Surface fragments:* About 70 percent gravel, about 5 percent cobbles, about 5 percent channers

*Depth to restrictive feature:* 4 to 10 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.4 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 2 inches; gravelly loam

Bk—2 to 4 inches; very gravelly loam

R—4 inches; bedrock

#### Mellenthin soils

*Landform:* Hillslopes on structural benches

*Parent material:* Residuum

*Slope:* 5 to 15 percent

*Surface fragments:* About 40 percent gravel, about 5 percent cobbles

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Galleta-Utah Juniper)

*Potential native vegetation:* Utah juniper, Indian ricegrass, blue grama, Mexican cliffrose, broom snakeweed, galleta, gooseberryleaf globemallow, needleandthread

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 2 inches; extremely gravelly sandy loam  
 Bk1—2 to 6 inches; extremely gravelly loam  
 Bk2—6 to 16 inches; extremely gravelly loam  
 R—16 inches; bedrock

**Minor Components**

Coarse-loamy Ustic Calciargids and similar soils

*Composition:* About 10 percent

*Landform:* Drainageways on structural benches

*Drainage class:* Well drained

## 5115—Sanostee, warm-Daklos-Hideout complex, 2 to 15 percent slopes

**Map Unit Setting**

*Elevation:* 4,900 to 5,800 feet (1,494 to 1,768 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located northeast of the town of Big Water on Smoky Mountain in the Kaiparowits Plateau region.

*Geology:* Straight Cliffs Formation, Drip Tank Member (Ksd)

**Map Unit Composition**

Sanostee, warm and similar soils: 40 percent

Daklos and similar soils: 25 percent

Hideout and similar soils: 20 percent

Minor components: 15 percent

**Component Descriptions****Sanostee, warm soils**

*Landform:* Plains on structural benches

*Parent material:* Eolian sand, sandstone residuum

*Slope:* 2 to 8 percent

*Surface fragments:* About 2 percent gravel

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 6.8 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 13 (moderately sodic)

*Ecological site:* Semidesert Sandy Loam (Spiny Hopsage)

*Potential native vegetation:* spiny hopsage, Cutler Mormon tea, Douglas' dustymaiden, Indian ricegrass, blackbrush, blue grama, galleta, needleandthread, sand dropseed

*Land capability subclass (nonirrigated):* 5s

*Typical Profile:*

A—0 to 4 inches; fine sandy loam

Bt—4 to 8 inches; sandy clay loam

Btk—8 to 38 inches; sandy clay loam

Bk—38 to 39 inches; sandy clay loam

R—39 inches; bedrock

**Daklos soils**

*Landform:* Structural benches

*Parent material:* Residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A1—0 to 2 inches; sandy loam

A2—2 to 6 inches; very gravelly loam

C—6 to 13 inches; very cobbly loam

R—13 inches; bedrock

**Hideout soils**

*Landform:* Structural benches

*Parent material:* Eolian sand over residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 15 percent gravel

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.9 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A1—0 to 4 inches; loamy sand  
 A2—4 to 6 inches; sandy loam  
 C—6 to 11 inches; very gravelly sandy loam  
 R—11 inches; bedrock

**Minor Components**

Straight Cliffs Formation Rock outcrop  
*Composition:* About 10 percent  
*Landform:* Structural benches  
 Coarse-loamy Ustic Haplocalcids and similar soils  
*Composition:* About 5 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Well drained

**5116—Stent-Minchey complex, 2 to 15 percent slopes****Map Unit Setting**

*Elevation:* 4,100 to 4,900 feet (1,250 to 1,494 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located east of the town of Big Water, south of Smoky Mountain at the base of the Kelly Grade on the Smoky Mountain Road and west of the town of Big Water, along the Paria River near Highway 89.  
*Geology:* Tropic Shale (Kt); Dakota Formation (Kd)

**Map Unit Composition**

Stent and similar soils: 50 percent  
 Minchey and similar soils: 35 percent

Minor components: 15 percent

**Component Descriptions****Stent soils**

*Landform:* Pediments, stream terrace remnants  
*Parent material:* Mixed alluvium  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 30 percent gravel, about 5 percent cobbles, about 5 percent channers  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 5.0 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 1 (slightly sodic)  
*Ecological site:* Desert Stony Loam (Shadscale-Bud Sagebrush)  
*Potential native vegetation:* galleta, shadscale, bud sagebrush, Bigelow sagebrush, Indian ricegrass, Torrey Mormon tea, sand dropseed, woolly locoweed  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 4 inches; very gravelly fine sandy loam  
 Bw—4 to 9 inches; gravelly loam  
 Bk1—9 to 20 inches; very gravelly sandy clay loam  
 Bk2—20 to 25 inches; very gravelly sandy loam  
 Bk3—25 to 35 inches; very gravelly sandy loam  
 Bk4—35 to 46 inches; very gravelly loam  
 C1—46 to 72 inches; gravelly fine sandy loam  
 C2—72 to 79 inches; gravelly sandy loam

**Minchey soils**

*Landform:* Pediments, stream terrace remnants  
*Parent material:* Mixed alluvium  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 5 percent gravel  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 7.3 inches (moderate)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Loam (Shadscale)  
*Potential native vegetation:* shadscale, galleta, Indian

ricegrass, Nevada Mormon tea, broom snakeweed, bud sagebrush, gooseberryleaf globemallow, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A1—0 to 2 inches; loamy fine sand  
 A2—2 to 6 inches; fine sandy loam  
 Bk1—6 to 24 inches; sandy clay loam  
 Bk2—24 to 40 inches; gravelly sandy clay loam  
 C1—40 to 49 inches; very gravelly sandy loam  
 C2—49 to 60 inches; sandy loam

**Minor Components**

Fine-loamy Typic Torriorthents and similar soils

*Composition:* About 7 percent

*Landform:* Pediments, stream terrace remnants

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

Loamy-skeletal Torrifluvents and similar soils

*Composition:* About 4 percent

*Landform:* Washes, channels

*Drainage class:* Well drained

Straight Cliffs Formation Rock outcrop

*Composition:* About 4 percent

*Landform:* Dissected structural benches

**5117—Sheppard-Badland (Carmel and Entrada Formations) complex, 5 to 30 percent slopes**

**Map Unit Setting**

*Elevation:* 4,000 to 4,800 feet (1,220 to 1,463 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located between the town of Big Water and the Cockscomb along Highway 89.

*Geology:* Entrada Sandstone (Je); Upper Carmel Formation (Jcu)

**Map Unit Composition**

Sheppard and similar soils: 60 percent

Carmel and Entrada Formation Badland: 25 percent

Minor components: 15 percent

**Component Descriptions**

**Sheppard soils**

*Landform:* Dunes on dissected structural benches

*Parent material:* Eolian sand

*Slope:* 5 to 30 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 5.0 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sand (Sand Sagebrush)

*Potential native vegetation:* Indian ricegrass, sand dropseed, sand sagebrush, Cutler Mormon tea, fourwing saltbush, gooseberryleaf globemallow, sand buckwheat, sandhill muhly

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

C1—0 to 5 inches; loamy fine sand

C2—5 to 28 inches; loamy fine sand

C3—28 to 60 inches; loamy fine sand

**Carmel and Entrada Formation Badland**

*Landform:* Escarpments and dissected structural benches

*Slope:* 15 to 50 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Moenkopie, saline and similar soils

*Composition:* About 7 percent

*Landform:* Hillslopes on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Desert Shallow Sandy Loam (Shadscale)

Typic Torrifluvents and similar soils

*Composition:* About 4 percent

*Landform:* Channels and washes

*Drainage class:* Well drained

Lithic Torripsamments and similar soils

*Composition:* About 4 percent

*Landform:* Escarpments  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained

### **5118—Mido-Kenzo-Rock outcrop (Carmel Formation) complex, 2 to 30 percent slopes**

#### **Map Unit Setting**

*Elevation:* 4,200 to 5,000 feet (1,281 to 1,524 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 54 degrees F (7.0 to 12.0 degrees C)  
*Frost-free period:* 120 to 180 days  
*Note:* Located west of the town of Big Water, near Highway 89, on East and West Clark Benches and northwest of Big Water on Rock Springs Bench.  
*Geology:* Upper Carmel Formation (Jcu); Page Sandstone, Thousand Pockets Tongue (Jpt)

#### **Map Unit Composition**

Mido and similar soils: 40 percent  
 Kenzo and similar soils: 30 percent  
 Carmel Formation Rock outcrop: 15 percent  
 Minor components: 15 percent

#### **Component Descriptions**

##### **Mido soils**

*Landform:* Dunes on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 15 percent  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sand (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed, Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush  
*Land capability subclass (nonirrigated):* 7s

##### *Typical Profile:*

A—0 to 29 inches; loamy fine sand  
 C—29 to 60 inches; fine sand

##### **Kenzo soils**

*Landform:* Escarpments on structural benches  
*Parent material:* Eolian sand over residuum  
*Slope:* 10 to 30 percent  
*Surface fragments:* About 10 percent gravel, about 5 percent cobbles, about 3 percent stones  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.9 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

##### *Typical Profile:*

A—0 to 2 inches; very gravelly loam  
 C—2 to 11 inches; gravelly loam  
 R—11 inches; bedrock

##### **Carmel Formation Rock outcrop**

*Landform:* Structural benches  
*Slope:* 10 to 50 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

##### **Minor Components**

Ustic Torriorthents and similar soils  
*Composition:* About 10 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
 Arches, dry and similar soils  
*Composition:* About 3 percent  
*Landform:* Sand sheets on structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Semidesert Shallow Sand (Utah Juniper-Pinyon)  
 Ustic Torrifluvents and similar soils  
*Composition:* About 2 percent  
*Landform:* Channels and washes

*Drainage class:* Somewhat poorly drained

## 5120—Pinepoint-Flatnose complex, 2 to 8 percent slopes

### Map Unit Setting

*Elevation:* 5,450 to 6,030 feet (1,662 to 1,837 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located below the White Cliffs in the areas of Johnson Canyon and Nephi Pasture.

*Geology:* Alluvium from Navajo Sandstone (Jn); Kayenta Formation, main body (Jk); Moenave Formation (Jmo)

### Map Unit Composition

Pinepoint and similar soils: 55 percent

Flatnose and similar soils: 35 percent

Minor components: 10 percent

### Component Descriptions

#### Pinepoint soils

*Landform:* Drainageways, alluvial flats

*Parent material:* Eolian sand

*Slope:* 2 to 8 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 4.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Negligible

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Sand (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush, blue grama, rubber rabbitbrush, sand sagebrush, Gambel oak, Indian ricegrass, broom snakeweed, green Mormon tea, sandhill muhly

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

C1—0 to 19 inches; loamy fine sand

C2—19 to 38 inches; fine sand

C3—38 to 60 inches; fine sand

#### Flatnose soils

*Landform:* Alluvial flats, drainageways

*Parent material:* Mixed alluvium, some reworked eolian deposits

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 6.5 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Loamy Bottom (Basin Big Sagebrush)

*Potential native vegetation:* basin big sagebrush, basin wildrye, Indian ricegrass, rubber rabbitbrush, Sandberg bluegrass, fourwing saltbush, muttongrass, western wheatgrass

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 13 inches; fine sand

C—13 to 16 inches; fine sandy loam

2C1—16 to 31 inches; loam

2C2—31 to 41 inches; loamy sand

3C1—41 to 52 inches; sand

3C2—52 to 60 inches; silt loam

#### Minor Components

Parkwash and similar soils

*Composition:* About 10 percent

*Landform:* Sand sheets and dunes

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Upland Shallow Sand (Pinyon-Utah Juniper)

## 5121—Trail-Riverwash complex, 0 to 5 percent slopes

### Map Unit Setting

*Elevation:* 3,800 to 4,300 feet (1,159 to 1,311 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located between Lake Powell and Smokey Mountain in Smokey Hollow, Tibbet Canyon, Wesses Canyon, and Warm Creek.

*Geology:* Alluvium from Wahweap Formation, Lower Member (Kwl); Tropic Shale (Kt)

#### Map Unit Composition

Trail and similar soils: 55 percent

Riverwash: 30 percent

Minor components: 15 percent

#### Component Descriptions

##### Trail soils

*Landform:* Channels, valley flats

*Parent material:* Mixed alluvium

*Slope:* 0 to 5 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 4.7 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Runoff class:* Negligible

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Sandy Bottom (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, galleta,

fourwing saltbush, green Mormon tea, sand

dropseed, scarlet globemallow, winterfat

*Land capability subclass (nonirrigated):* 5c

##### Typical Profile:

A—0 to 11 inches; loamy fine sand

C1—11 to 29 inches; loamy fine sand

C2—29 to 60 inches; loamy sand

##### Riverwash

*Landform:* Stream channels

*Slope:* 0 to 8 percent

*Drainage class:* Poorly drained

*Flooding hazard:* Occasional

*Land capability subclass (nonirrigated):* 8

##### Minor Components

Nepalto and similar soils

*Composition:* About 10 percent

*Landform:* Drainageways, small narrow stream terraces

*Drainage class:* Somewhat excessively drained

*Ecological site:* Desert Stony Loam (Blackbrush)

Hanksville family and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Desert Loam (Shadscale)

## 5122—Mido-Mivida complex, 2 to 15 percent slopes

#### Map Unit Setting

*Elevation:* 4,400 to 5,380 feet (1,341 to 1,640 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located on West and East Clark Benches, near the town of Church Wells. Vegetation on this unit varies from primarily Fourwing Saltbush and grasses on West and East Clark Benches to primarily Wyoming Big Sagebrush north of Highway 89 and west of the Cockscomb on both soil components.

*Geology:* Page Sandstone, Thousand Pockets Tongue (Jpt); Chinle Formation, Upper Member (Monitor Butte, Petrified Forest, and Owl Rock Members) (TRcu); Moenkopi Formation, Timpoweap Member (TRmt)

#### Map Unit Composition

Mido and similar soils: 50 percent

Mivida and similar soils: 25 percent

Minor components: 25 percent

#### Component Descriptions

##### Mido soils

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 4 to 15 percent

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sand (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, fourwing saltbush, galleta, needleandthread, sand dropseed,

Cutler Mormon tea, gooseberryleaf globemallow, sand buckwheat, sand sagebrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; fine sand

C1—4 to 16 inches; fine sand

C2—16 to 60 inches; fine sand

**Mivida soils**

*Landform:* Plains on structural benches

*Parent material:* Eolian sand, mixed alluvium

*Slope:* 2 to 8 percent

*Surface fragments:* About 2 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.4 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 5 inches; loamy fine sand

Bw—5 to 23 inches; sandy loam

Bk—23 to 38 inches; fine sandy loam

Ck—38 to 60 inches; gravelly loam

**Minor Components**

Mivida, moist and similar soils

*Composition:* About 14 percent

*Landform:* Plains on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

Sazi, moist and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

Coarse-loamy Ustic Haplargids and similar soils

*Composition:* About 5 percent

*Landform:* Climbing dunes, dunes on structural benches

*Drainage class:* Well drained

Barx and similar soils

*Composition:* About 1 percent

*Landform:* Plains on structural benches

*Drainage class:* Well drained

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

**5123—Billings-Jocity, saline complex, 0 to 8 percent slopes**

**Map Unit Setting**

*Elevation:* 4,400 to 4,900 feet (1,341 to 1,494 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located near the Paria River in the Cockscomb area, along the Cottonwood Road.

*Geology:* Tropic Shale (Kt)

**Map Unit Composition**

Billings and similar soils: 75 percent

Jocity, saline and similar soils: 15 percent

Minor components: 10 percent

**Component Descriptions**

**Billings soils**

*Landform:* Flood plain and valley floor in strike valley

*Parent material:* Alluvium

*Slope:* 0 to 8 percent

*Surface fragments:* About 5 percent gravel, about 1 percent cobbles

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.6 inches (high)

*Shrink-swell potential:* About 6.5 percent (high)

*Flooding hazard:* Very Rare

*Runoff class:* High

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 8 percent

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Alkali Bottom (Greasewood)

*Potential native vegetation:* greasewood, alkali sacaton, Torrey seepweed, bottlebrush squirreltail, sand dropseed

*Land capability subclass (nonirrigated):* 5e

*Typical Profile:*

- A—0 to 4 inches; clay loam
- C1—4 to 27 inches; silty clay loam
- C2—27 to 31 inches; clay loam
- C3—31 to 43 inches; silty clay loam
- Cy—43 to 64 inches; silty clay loam

**Jocity, saline soils**

*Landform:* Small alluvial fans, stream terraces, and flood plains in strike valley

*Parent material:* Alluvium

*Slope:* 0 to 8 percent

*Surface fragments:* About 5 percent gravel, about 2 percent cobbles, about 2 percent channers

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 7.8 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Flooding hazard:* Very Rare

*Runoff class:* Low

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 4 mmhos/cm (very slightly saline)

*Sodium adsorption ratio maximum:* About 10 (slightly sodic)

*Ecological site:* Alkali Bottom (Greasewood)

*Potential native vegetation:* greasewood, alkali sacaton, Torrey seepweed, bottlebrush squirreltail, sand dropseed

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

- A—0 to 4 inches; fine sandy loam
- C1—4 to 20 inches; loam
- C2—20 to 33 inches; gravelly sandy loam
- Ab—33 to 37 inches; sandy clay loam
- Cb1—37 to 46 inches; loam
- Cb2—46 to 73 inches; fine sandy loam
- Cb3—73 to 79 inches; fine sandy loam

**Minor Components**

Hanksville and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes adjacent to valley

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Desert Shallow Clay (Mat Saltbush)

Coarse-loamy Torrifluvents and similar soils

*Composition:* About 3 percent

*Landform:* Washes and channels

*Drainage class:* Well drained

Loamy-skeletal Torrifluvents and similar soils

*Composition:* About 2 percent

*Landform:* Washes and channels

*Drainage class:* Well drained

**5125—Clapper very gravelly loam, 2 to 15 percent slopes****Map Unit Setting**

*Elevation:* 5,070 to 6,000 feet (1,545 to 1,829 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Kanab, along the UT/AZ state line, near Buckskin Mountain and southeast of the town of Cannonville along the Cottonwood Road on Wiggler Wash.

*Geology:* Mixed alluvium

**Map Unit Composition**

Clapper and similar soils: 85 percent

Minor components: 15 percent

**Component Descriptions****Clapper soils**

*Landform:* Fan remnants in strike valley

*Parent material:* Mixed alluvium

*Slope:* 2 to 15 percent

*Surface fragments:* About 40 percent gravel, about 15 percent cobbles

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.6 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

- A—0 to 3 inches; very gravelly loam
- Bw—3 to 10 inches; gravelly loam
- Bk1—10 to 21 inches; very gravelly loam

Bk2—21 to 38 inches; very gravelly loam  
 Bk3—38 to 60 inches; extremely gravelly loam

### Minor Components

Strych, moist and similar soils

*Composition:* About 10 percent  
*Landform:* stream terraces in strike valley  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

Progresso family and similar soils

*Composition:* About 5 percent  
*Landform:* Alluvial flats in strike valley  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

## 5126—Pinpoint-Parkwash complex, 2 to 15 percent slopes

### Map Unit Setting

*Elevation:* 5,550 to 6,500 feet (1,692 to 1,981 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located just below the White Cliffs, between Johnson Canyon and the Cockscomb.  
*Geology:* Navajo Sandstone (Jn)

### Map Unit Composition

Pinpoint and similar soils: 75 percent  
 Parkwash and similar soils: 15 percent  
 Minor components: 10 percent

### Component Descriptions

#### Pinpoint soils

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 15 percent  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* Greater than 20 in/hr (very rapid)  
*Available water capacity:* About 4.2 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Sand (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush, blue grama, rubber rabbitbrush, sand sagebrush, Gambel oak, Indian ricegrass, broom snakeweed, green Mormon tea, sandhill muhly  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 6 inches; fine sand  
 C1—6 to 15 inches; fine sand  
 C2—15 to 60 inches; fine sand

### Parkwash soils

*Landform:* Blowouts on structural benches, dunes on structural benches, climbing dunes  
*Parent material:* Eolian sand over residuum  
*Slope:* 2 to 15 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* Greater than 20 in/hr (very rapid)  
*Available water capacity:* About 0.9 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Sand (Pinyon-Utah Juniper)  
*Potential native vegetation:* Utah juniper, twoneedle pinyon, Indian ricegrass, green Mormon tea, mountain big sagebrush, pointleaf manzanita, antelope bitterbrush, blue grama, needleandthread  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

C1—0 to 6 inches; fine sand  
 C2—6 to 13 inches; fine sand  
 R—13 inches; bedrock

### Minor Components

Navajo Sandstone Rock outcrop  
*Composition:* About 7 percent  
*Landform:* Slickrock on structural benches  
 Ustfluvents and similar soils  
*Composition:* About 3 percent  
*Landform:* Washes

## 5127—Skyvillage-Mikim-Badland (Kaiparowits Formation) complex, 2 to 15 percent slopes

### Map Unit Setting

*Elevation:* 5,700 to 6,500 feet (1,738 to 1,982 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located just east of the Cockscomb and just south of Canaan Peak, in the area of Horse Flat, Fourmile Bench, and Horse Mountain.

*Geology:* Kaiparowits Formation (Kk); Wahweap Formation, Upper Member (Kwu)

### Map Unit Composition

Skyvillage and similar soils: 50 percent

Mikim and similar soils: 20 percent

Kaiparowits Formation Badland: 15 percent

Minor components: 15 percent

### Component Descriptions

#### Skyvillage soils

*Landform:* Structural benches

*Parent material:* Alluvium, sandstone residuum

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.6 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 3 inches; loamy sand

C1—3 to 8 inches; sandy loam

C2—8 to 13 inches; gravelly loam

R—13 inches; bedrock

#### Mikim soils

*Landform:* Structural benches

*Parent material:* Alluvium

*Slope:* 2 to 10 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 10.0 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 7 inches; loam

C1—7 to 31 inches; loam

C2—31 to 43 inches; loam

C3—43 to 60 inches; loam

#### Kaiparowits Formation Badland

*Landform:* Structural benches

*Slope:* 10 to 45 percent

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Salinity maximum:* About 20 mmhos/cm (strongly saline)

*Land capability subclass (nonirrigated):* 8

#### Minor Components

Fine-loamy Ustic Torriorthents and similar soils

*Composition:* About 7 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

Loamy-skeletal Ustic Haplocalcids and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Drainage class:* Well drained

Coarse-loamy Ustic Haplargids and similar soils

*Composition:* About 3 percent

*Landform:* Structural benches

*Drainage class:* Well drained

## 5128—Curecanti-Zibetod families complex, 30 to 70 percent slopes

### Map Unit Setting

*Elevation:* 6,800 to 7,600 feet (2,073 to 2,317 meters)

*Mean annual precipitation:* 12 to 20 inches (305 to 508 millimeters)

*Mean annual air temperature:* 37 to 45 degrees F (3.0 to 7.0 degrees C)

*Frost-free period:* 60 to 100 days

*Notes:* 1) This map unit covers two climate regimes: Mountain and Upland. This is a result of the microclimatic effects of aspect. The Curecanti Family component is correlated to a Mountain ecological site and primarily exists on slopes with directly north-facing aspects. The Zibetod Family component is correlated to an Upland ecological site and occurs on slopes with northwestern and northeastern aspects.

2) This map unit is located south of the town of Escalante on north-facing slopes on Fiftymile Mountain in the Kaiparowits Plateau region and southwest of the town of Cannonville along the Skutumpah Road up Lick Wash.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Wahweap Formation, Lower Member (Kwl); Wahweap Formation, Upper Member (Kwu); Straight Cliffs Formation, Lower Member (Ksl)

### Map Unit Composition

Curecanti family and similar soils: 60 percent

Zibetod family and similar soils: 25 percent

Minor components: 15 percent

### Component Descriptions

#### Curecanti family soils

*Landform:* Mountain slopes on the side of structural benches

*Parent material:* Colluvium, slope alluvium

*Slope:* 30 to 70 percent

*Surface fragments:* About 5 percent cobbles, about 5 percent stones

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 4.3 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 3 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Mountain Stony Loam (Oak)

*Potential native vegetation:* mountain brome, Gambel oak, Sandberg bluegrass, antelope bitterbrush, muttongrass, mountain big sagebrush

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 6 inches; loam

Bw—6 to 11 inches; loam

Bt1—11 to 20 inches; very gravelly clay loam

Bt2—20 to 32 inches; very gravelly clay loam

R—32 inches; bedrock

#### Zibetod family soils

*Landform:* Mountain slopes and escarpments on the side of structural benches

*Parent material:* Residuum, colluvium

*Slope:* 30 to 70 percent

*Surface fragments:* About 5 percent cobbles, about 5 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.3 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 3 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* Indian ricegrass, black sagebrush, twoneedle pinyon, antelope bitterbrush, mountain big sagebrush, Utah juniper, blue grama, needleandthread

*Land capability subclass (nonirrigated):* 6c

#### Typical Profile:

A—0 to 4 inches; loam

Bw—4 to 9 inches; loam

Bt—9 to 18 inches; very gravelly clay loam

R—18 inches; bedrock

#### Minor Components

Coarse-loamy Typic Haplustalfs and similar soils

*Composition:* About 8 percent

*Landform:* Mountain slopes on the side of structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

Clayey Lithic Haplustalfs and similar soils

*Composition:* About 7 percent

*Landform:* Mountain slopes on the side of structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

### **5129—Skyvillage-Rock outcrop (Wahweap Formation) complex, 2 to 15 percent slopes**

#### **Map Unit Setting**

*Elevation:* 5,900 to 6,300 feet (1,799 to 1,921 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the Cockscomb and south of Canaan Peak, on Fourmile Bench and Horse Flat, in the Kaiparowits Plateau region.

*Geology:* Wahweap Formation, Lower member (Kwl); Wahweap Formation, Upper Member (Kwu); Kaiparowits Formation (Kk)

#### **Map Unit Composition**

Skyvillage and similar soils: 50 percent

Wahweap Formation Rock outcrop: 35 percent

Minor components: 15 percent

#### **Component Descriptions**

##### **Skyvillage soils**

*Landform:* Structural benches

*Parent material:* Alluvium, sandstone residuum

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.1 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

#### *Typical Profile:*

A1—0 to 1 inch; sandy loam

A2—1 to 6 inches; sandy loam

C—6 to 9 inches; sandy clay loam

R—9 inches; bedrock

### **Wahweap Formation Rock outcrop**

*Landform:* Structural benches

*Slope:* 2 to 25 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### **Minor Components**

Daklos and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

Coarse-loamy Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

Fine-loamy Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

### **5130—Progresso-Begay, dry complex, 1 to 8 percent slopes**

#### **Map Unit Setting**

*Elevation:* 5,100 to 6,300 feet (1,555 to 1,921 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located north of the town of Church Wells, on Brigham Plains, Jack Riggs Bench, Horse Flat, and Fourmile Bench.

*Geology:* Straight Cliffs Formation, Drip Tank Member (Ksd); Wahweap Formation, Upper Member (Kwu); Kaiparowits Formation (Kk)

### Map Unit Composition

Progresso and similar soils: 65 percent  
Begay, dry and similar soils: 20 percent  
Minor components: 15 percent

### Component Descriptions

#### Progresso soils

*Landform:* Alluvial flats on structural benches  
*Parent material:* Alluvium  
*Slope:* 1 to 8 percent  
*Surface fragments:* About 5 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 3.7 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, Wyoming big sagebrush, fourwing saltbush, galleta, green Mormon tea  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 2 inches; sandy loam  
Bt—2 to 12 inches; sandy clay loam  
Btk—12 to 16 inches; sandy clay loam  
Bk—16 to 22 inches; loam  
R—22 inches; bedrock

#### Begay, dry soils

*Landform:* Alluvial flats on structural benches  
*Parent material:* Alluvium  
*Slope:* 1 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 7.0 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Fourwing Saltbush)

*Potential native vegetation:* Indian ricegrass, needleandthread, fourwing saltbush, galleta, sand dropseed, Cutler Mormon tea, winterfat  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A1—0 to 2 inches; loamy fine sand  
A2—2 to 8 inches; loamy fine sand  
Bw—8 to 33 inches; fine sandy loam  
Ck1—33 to 57 inches; fine sandy loam  
Ck2—57 to 60 inches; gravelly loam

### Minor Components

Loamy-skeletal Lithic Ustic Torriorthents and similar soils

*Composition:* About 8 percent  
*Landform:* Alluvial flats on structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

Loamy Lithic Calciargids and similar soils

*Composition:* About 7 percent  
*Landform:* Alluvial flats on structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

### 5131—Badland (Kaiparowits Formation)-Lazear, steep complex, 15 to 60 percent slopes

#### Map Unit Setting

*Elevation:* 5,100 to 6,800 feet (1,555 to 2,073 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located south of Canaan Peak, near Horse Mountain, on the northern edge of the Kaiparowits Plateau.

*Geology:* Kaiparowits Formation (Kk); Wahweap Formation, Upper Member (Kwu)

#### Map Unit Composition

Kaiparowits Formation Badland: 60 percent  
Lazear, steep and similar soils: 25 percent  
Minor components: 15 percent

### Component Descriptions

#### Kaiparowits Formation Badland

*Landform:* Structural benches  
*Slope:* 15 to 100 percent  
*Slowest permeability:* 0.06 to 0.2 in/hr (slow)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Salinity maximum:* About 20 mmhos/cm (strongly saline)  
*Land capability subclass (nonirrigated):* 8

#### Lazear, steep soils

*Landform:* Hillslopes on dissected structural benches  
*Parent material:* Residuum  
*Slope:* 15 to 60 percent  
*Surface fragments:* About 25 percent gravel, about 15 percent cobbles, about 10 percent stones  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 0.7 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 2 inches; very cobbly loam  
 C—2 to 6 inches; parachannery loam  
 Cr—6 to 10 inches; weathered bedrock  
 R—10 inches; bedrock

#### Minor Components

Menefee and similar soils  
*Composition:* About 6 percent  
*Landform:* Dissected structural benches, hillslopes  
*Depth to restrictive feature:* 8 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
 Clapper, dry and similar soils  
*Composition:* About 4 percent

*Landform:* Stream terrace remnants

*Drainage class:* Well drained

*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)

Cannonville and similar soils

*Composition:* About 3 percent

*Landform:* Hillslopes

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)

Ustic Torrifluvents and similar soils

*Composition:* About 2 percent

*Landform:* Channels and washes

*Drainage class:* Poorly drained

### 5132—Strych-Horsemountain-Barx complex, 2 to 15 percent slopes

#### Map Unit Setting

*Elevation:* 6,000 to 7,200 feet (1,829 to 2,195 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located south of Canaan Peak, on Horse Mountain and along the eastern base of the Cockscomb, on the northern edge of the Kaiparowits Plateau. Also located south of the town to Henrieville on Little Creek Wood Bench.

*Geology:* Alluvium from Claron Formation over Kaiparowits Formation (Kk)

#### Map Unit Composition

Strych and similar soils: 40 percent  
 Horsemountain and similar soils: 25 percent  
 Barx and similar soils: 20 percent  
 Minor components: 15 percent

#### Component Descriptions

##### Strych soils

*Landform:* Remnant stream terraces

*Parent material:* Alluvium

*Slope:* 2 to 15 percent

*Surface fragments:* About 35 percent gravel, about 2 percent cobbles

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Indian ricegrass, Utah juniper, galleta, green Mormon tea, roundleaf buffaloberry, Wyoming big sagebrush, broom snakeweed, needleandthread, twoneedle pinyon

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

- A—0 to 2 inches; gravelly fine sandy loam
- Bw—2 to 4 inches; gravelly fine sandy loam
- Bk1—4 to 7 inches; very gravelly fine sandy loam
- Bk2—7 to 35 inches; very cobbly sandy loam
- Bk3—35 to 56 inches; gravelly loam
- C—56 to 65 inches; channery fine sandy loam

### **Horsemountain soils**

*Landform:* Remnant stream terraces

*Parent material:* Alluvium

*Slope:* 2 to 15 percent

*Surface fragments:* About 5 percent gravel, about 2 percent cobbles

*Depth to restrictive feature:* 8 to 20 inches to indurated petrocalcic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.6 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 40 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Hardpan (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Indian ricegrass, Wyoming big sagebrush, green Mormon tea, twoneedle pinyon, Mexican cliffrose, blue grama, galleta, purple threeawn, roundleaf buffaloberry

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

- A—0 to 4 inches; fine sandy loam
- Bt—4 to 7 inches; loam

Btk—7 to 14 inches; gravelly fine sandy loam

Bkm—14 to 19 inches; extremely gravelly loamy sand

Bk1—19 to 32 inches; very gravelly fine sandy loam

Bk2—32 to 61 inches; extremely gravelly loamy fine sand

Bk3—61 to 69 inches; gravelly fine sandy loam

### **Barx soils**

*Landform:* Alluvial flats on remnant stream terraces

*Parent material:* Alluvium, reworked eolian material

*Slope:* 2 to 15 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 8.6 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate maximum:* About 45 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

- A—0 to 6 inches; sandy loam
- Bw—6 to 11 inches; loam
- Bt—11 to 24 inches; clay loam
- Bk1—24 to 41 inches; loam
- Bk2—41 to 60 inches; gravelly loam

### **Minor Components**

Kaiparowits Formation Badland

*Composition:* About 5 percent

*Landform:* Escarpments

Lazear, dry and similar soils

*Composition:* About 5 percent

*Landform:* Ledges on escarpments

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

Fine-loamy Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Remnant stream terraces  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained

### **5133—Menefee-Badland (Kaiparowits Formation) complex, 5 to 30 percent slopes**

#### **Map Unit Setting**

*Elevation:* 6,900 to 7,900 feet (2,104 to 2,409 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located southwest of the town of Escalante, just under Canaan Peak, above Death Ridge and Horse Mountain and southwest of the town of Cannonville along the Skutumpah Road, up Jim Hollow.  
*Geology:* Kaiparowits Formation (Kk); Wahweap Formation, Upper Member (Kwu)

#### **Map Unit Composition**

Menefee and similar soils: 55 percent  
 Kaiparowits Formation Badland: 35 percent  
 Minor components: 10 percent

#### **Component Descriptions**

##### **Menefee soils**

*Landform:* Dissected structural benches, hillslopes  
*Parent material:* Residuum  
*Slope:* 5 to 30 percent  
*Surface fragments:* About 25 percent gravel  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.6 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea,

Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

#### *Typical Profile:*

A—0 to 3 inches; loam  
 C—3 to 10 inches; loam  
 Cr—10 inches; weathered bedrock

#### **Kaiparowits Formation Badland**

*Landform:* Escarpments  
*Slope:* 5 to 50 percent  
*Slowest permeability:* 0.06 to 0.2 in/hr (slow)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Salinity maximum:* About 20 mmhos/cm (strongly saline)  
*Land capability subclass (nonirrigated):* 8

#### **Minor Components**

Clayey shallow Aridic Ustorthents and similar soils  
*Composition:* About 10 percent  
*Landform:* Escarpments  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained

### **5136—Suzmayne-Colskel-Rock outcrop (Straight Cliffs Formation) complex, 10 to 40 percent slopes**

#### **Map Unit Setting**

*Elevation:* 6,300 to 7,600 feet (1,921 to 2,317 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located southwest of the town of Escalante, in the upper Canaan Creek area.  
*Geology:* Straight Cliffs Formation, Lower Member (Ksl); Straight Cliffs Formation, John Henry Member (Ksj)

#### **Map Unit Composition**

Suzmayne and similar soils: 60 percent  
 Straight Cliffs Formation Rock outcrop: 15 percent  
 Colskel and similar soils: 15 percent  
 Minor components: 10 percent

## Component Descriptions

### Suzmayne soils

*Landform:* Hillslopes on structural benches, ridges on structural benches  
*Parent material:* Burnt sandstone and shale residuum and colluvium  
*Slope:* 10 to 40 percent  
*Surface fragments:* About 15 percent gravel, about 5 percent cobbles, about 15 percent channers, about 5 percent flagstones, about 5 percent stones  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 2.9 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Stony Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* Utah juniper, Utah serviceberry, twoneedle pinyon, Gambel oak, Indian ricegrass, alderleaf mountainmahogany, antelope bitterbrush, mountain big sagebrush, muttongrass  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 7 inches; very gravelly loam  
 C1—7 to 13 inches; gravelly loam  
 C2—13 to 27 inches; very gravelly loam  
 R—27 inches; bedrock

### Straight Cliffs Formation Rock outcrop

*Landform:* Structural benches  
*Slope:* 10 to 70 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

### Colskel soils

*Landform:* Hillslopes on structural benches  
*Parent material:* Residuum, colluvium  
*Slope:* 10 to 40 percent  
*Surface fragments:* About 10 percent gravel, about 15 percent cobbles, about 10 percent flagstones, about 15 percent stones  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.7 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 6 inches; very stony loam  
 C—6 to 17 inches; very stony loam  
 R—17 inches; bedrock

### Minor Components

Evpark and similar soils

*Composition:* About 7 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)

Clayey Aridic Ustorthents and similar soils

*Composition:* About 3 percent  
*Landform:* Escarpments on structural benches  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained

### 5137—Casmos-Pariette families-Rock outcrop (Dakota and Morrison Formation) complex, 2 to 30 percent slopes

#### Map Unit Setting

*Elevation:* 4,370 to 5,000 feet (1,333 to 1,524 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located on Dakota Formation west of the town of Church Wells at the south end of the Cottonwood Road. Also mapped on Morrison Formation on the

north end of Grand Bench and at the south end of Croton Canyon. Vegetation on this unit varies from primarily shadscale, on both soil components, near the Cottonwood Road, to primarily blackbrush on Grand Bench and along the Croton Road.

*Geology:* Dakota Formation (Kd); Morrison Formation (Jm); Tropic Shale (Kt); minor amounts of Entrada Sandstone (Je)

### Map Unit Composition

Casmos family and similar soils: 40 percent

Pariette family and similar soils: 30 percent

Dakota and Morrison Formation Rock outcrop: 15 percent

Minor components: 15 percent

### Component Descriptions

#### Casmos family soils

*Description:* Casmos is mapped as a family because it is traditionally mapped in cool mesic areas and this map unit is warm mesic.

*Landform:* Structural benches, dipslope of cuestas

*Parent material:* Slope alluvium, residuum

*Slope:* 2 to 30 percent

*Surface fragments:* About 30 percent gravel, about 10 percent cobbles, about 10 percent channers, about 20 percent flagstones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.5 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Shallow Loam (Shadscale)

*Potential native vegetation:* shadscale, galleta, Indian ricegrass, Nevada Mormon tea, fineleaf hymenopappus, gooseberryleaf globemallow

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 3 inches; gravelly loam

C1—3 to 10 inches; gravelly loam

C2—10 to 13 inches; channery loam

R—13 inches; bedrock

#### Pariette family soils

*Landform:* Structural benches, dipslope of cuestas

*Parent material:* Alluvium over residuum

*Slope:* 2 to 8 percent

*Surface fragments:* About 5 percent gravel

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.4 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 3 percent

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Loam (Shadscale)

*Potential native vegetation:* shadscale, galleta, Indian ricegrass, Nevada Mormon tea, broom snakeweed, bud sagebrush, gooseberryleaf globemallow, winterfat

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; fine sandy loam

Bw—3 to 9 inches; loam

Bk1—9 to 15 inches; loam

Bk2—15 to 29 inches; loam

Bk3—29 to 38 inches; very gravelly loam

Cr—38 inches; weathered bedrock

#### Dakota and Morrison Formation Rock outcrop

*Landform:* Structural benches, dipslope of cuestas

*Slope:* 2 to 30 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Minor Components

Tsaya and similar soils

*Composition:* About 10 percent

*Landform:* Hillslopes on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)

Loamy shallow Typic Torriorthents and similar soils

*Composition:* About 3 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

Chipeta and similar soils

*Composition:* About 2 percent

*Landform:* Hillslopes

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained  
*Ecological site:* Desert Shallow Clay (Mat Saltbush)

### 5138—Nakai-Sheppard complex, 2 to 15 percent slopes

#### Map Unit Setting

*Elevation:* 4,000 to 5,000 feet (1,220 to 1,524 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located near the towns of Big Water and Church Wells, along Highway 89.  
*Geology:* Entrada Sandstone (Je)

#### Map Unit Composition

Nakai and similar soils: 55 percent  
 Sheppard and similar soils: 30 percent  
 Minor components: 15 percent

#### Component Descriptions

##### Nakai soils

*Landform:* Sand sheets on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 15 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.1 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sandy Loam (Fourwing Saltbush)  
*Potential native vegetation:* Indian ricegrass, galleta, fourwing saltbush, gooseberryleaf globemallow, mesa dropseed, painted milkvetch, sand dropseed, spike dropseed  
*Land capability subclass (nonirrigated):* 5s

#### Typical Profile:

A—0 to 3 inches; fine sand  
 Bw—3 to 21 inches; loamy fine sand  
 Bk1—21 to 31 inches; fine sandy loam  
 Bk2—31 to 63 inches; fine sandy loam  
 C—63 to 79 inches; fine sand

##### Sheppard soils

*Landform:* Dunes on structural benches  
*Parent material:* Eolian sand  
*Slope:* 2 to 15 percent  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 5.3 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Sand (Sand Sagebrush)  
*Potential native vegetation:* Indian ricegrass, sand dropseed, sand sagebrush, Cutler Mormon tea, fourwing saltbush, gooseberryleaf globemallow, sand buckwheat, sandhill muhly  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 3 inches; fine sand  
 C1—3 to 44 inches; loamy fine sand  
 C2—44 to 61 inches; loamy fine sand  
 C3—61 to 79 inches; loamy fine sand

##### Minor Components

Carmel and Entrada Formation Rock outcrop  
*Composition:* About 8 percent  
*Landform:* Slickrock on structural benches  
 Pagina, cool and similar soils  
*Composition:* About 4 percent  
*Landform:* Low hills on structural benches  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Desert Sandy Loam (Fourwing Saltbush)  
 Moffat, cool and similar soils  
*Composition:* About 3 percent  
*Landform:* Plains on structural benches  
*Drainage class:* Well drained  
*Ecological site:* Desert Sandy Loam (Fourwing Saltbush)

### 5139—Hetz sandy loam, 0 to 3 percent slopes

#### Map Unit Setting

*Elevation:* 7,000 to 7,500 feet (2,134 to 2,287 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located southeast of the town of Escalante, on the top of Fiftymile Mountain, in the Kaiparowits Plateau region.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj)

#### Map Unit Composition

Hetz and similar soils: 90 percent

Minor components: 10 percent

#### Component Descriptions

##### Hetz soils

*Landform:* Drainageways on structural benches

*Parent material:* Alluvium

*Slope:* 0 to 3 percent

*Drainage class:* Poorly drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.6 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Flooding hazard:* Occasional

*Ponding hazard:* Occasional

*Seasonal high water table depth:* About 0 to 12 inches

*Runoff class:* Low

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semiwet Fresh Meadow

*Potential native vegetation:* Kentucky bluegrass, sedge, Baltic rush, basin wildrye, common dandelion, creeping bentgrass, field horsetail, plantain, western wheatgrass

*Land capability subclass (nonirrigated):* 6w

##### Typical Profile:

Oe—0 to 1 inch; slightly decomposed plant material

Oi—1 to 8 inches; moderately decomposed plant material

A—8 to 13 inches; sandy loam

Bg1—13 to 17 inches; sandy loam

Bg2—17 to 26 inches; sandy clay loam

Cg1—26 to 52 inches; sandy clay loam

Cg2—52 to 71 inches; sandy clay loam

##### Minor Components

Cumulic Endoaquolls and similar soils

*Composition:* About 10 percent

*Landform:* Drainageways on structural benches

*Drainage class:* Poorly drained

*Flooding hazard:* Frequent

### 5140—Green River-Radnik, moist-Suwanee, saline complex, 0 to 5 percent slopes

#### Map Unit Setting

*Elevation:* 4,300 to 5,400 feet (1,311 to 1,646 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located north of Highway 89 in the Paria River drainage, near the Paria Town Site and northeast of the town of Big Water in the Rogers Canyon Drainage on Fiftymile Mountain.

*Geology:* Mixed alluvium from a large variety of strata including Straight Cliffs Formation, Lower Member (Ksl); Straight Cliffs Formation, John Henry Member (Ksj); Carmel Formation (Jc); Navajo Sandstone (Jn)

#### Map Unit Composition

Green River and similar soils: 40 percent

Radnik, moist and similar soils: 30 percent

Suwanee, saline and similar soils: 20 percent

Minor components: 10 percent

#### Component Descriptions

##### Green River soils

*Landform:* Channels, flood plains

*Parent material:* Mixed recent alluvium

*Slope:* 0 to 5 percent

*Surface fragments:* About 2 percent gravel

*Drainage class:* Moderately well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.7 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Rare

*Runoff class:* Very low

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 4 mmhos/cm (very slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semiwet Saline Streambank (Fremont Cottonwood)

*Potential native vegetation:* alkali sacaton, coyote willow, desert saltgrass, Indian ricegrass, Fremont cottonwood, rubber rabbitbrush

*Land capability subclass (nonirrigated):* 5e

*Typical Profile:*

- A—0 to 7 inches; fine sandy loam
- C1—7 to 14 inches; fine sandy loam
- C2—14 to 29 inches; loamy fine sand
- C3—29 to 37 inches; loamy fine sand
- Ab—37 to 41 inches; fine sandy loam
- Cb1—41 to 48 inches; loamy fine sand
- Cb2—48 to 63 inches; gravelly loamy fine sand

**Radnik, moist soils**

*Landform:* Flood plains, stream terraces  
*Parent material:* Mixed recent alluvium  
*Slope:* 2 to 5 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 7.0 inches (moderate)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Flooding hazard:* Very Rare  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Loamy Bottom (Basin Big Sagebrush)  
*Potential native vegetation:* basin big sagebrush, basin wildrye, Indian ricegrass, rubber rabbitbrush, Sandberg bluegrass, fourwing saltbush, muttongrass, western wheatgrass  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

- A—0 to 3 inches; loam
- C1—3 to 9 inches; fine sandy loam
- C2—9 to 19 inches; fine sandy loam
- C3—19 to 30 inches; loamy fine sand
- C4—30 to 36 inches; loam
- C5—36 to 44 inches; very fine sandy loam
- C6—44 to 50 inches; fine sandy loam
- C7—50 to 59 inches; loamy fine sand
- C8—59 to 79 inches; stratified fine sandy loam to loam

**Suwanee, saline soils**

*Landform:* Flood plains, stream terraces  
*Parent material:* Mixed recent alluvium  
*Slope:* 0 to 5 percent  
*Surface fragments:* About 1 percent gravel  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 8.9 inches (moderate)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Flooding hazard:* Rare  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None*Salinity maximum:* About 4 mmhos/cm (very slightly saline)*Sodium adsorption ratio maximum:* About 0 (nonsodic)*Ecological site:* Alkali Bottom (Greasewood)*Potential native vegetation:* greasewood, alkali sacaton, Torrey seepweed, bottlebrush squirreltail, sand dropseed*Land capability subclass (nonirrigated):* 5c*Typical Profile:*

- A—0 to 2 inches; loam
- C1—2 to 9 inches; fine sandy loam
- C2—9 to 11 inches; sandy clay loam
- C3—11 to 22 inches; fine sandy loam
- Ab—22 to 28 inches; sandy clay loam
- Cb1—28 to 38 inches; loam
- Cb2—38 to 50 inches; very fine sandy loam
- Cb3—50 to 54 inches; loam
- Cb4—54 to 63 inches; fine sandy loam

**Minor Components**

Riverwash

*Composition:* About 10 percent*Landform:* Channels*Drainage class:* Poorly drained*Flooding hazard:* Very Frequent**5141—Radnik, moist-Suwanee, saline-Escavada complex, 0 to 8 percent slopes****Map Unit Setting***Elevation:* 5,500 to 6,500 feet (1,677 to 1,982 meters)*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)*Frost-free period:* 120 to 160 days

*Note:* Located southeast of the town of Escalante in the headwaters of the Alvey Wash and Wahweap Creek drainages and west of the town of Bigwater along Highway 89 in the Kitchen Corral Wash drainage. Also located northeast of the town of Big Water in drainages on Window Sash Bench, north of the town of Big Water in drainages around Long Flat, and in drainages northeast of the town of Tropic, along Henderson Creek and North Creek.

*Geology:* Alluvium from Kaiparowits Formation (Kk); Wahweap Formation, Lower Member (Kwl); Straight Cliffs Formation, John Henry Member (Ksj); Entrada Sandstone (Je)

### Map Unit Composition

Radnik, moist and similar soils: 50 percent  
 Escavada and similar soils: 15 percent  
 Suwanee, saline and similar soils: 15 percent  
 Minor components: 20 percent

### Component Descriptions

#### Radnik, moist soils

*Landform:* Alluvial flats, flood plains  
*Parent material:* Mixed recent alluvium  
*Slope:* 2 to 5 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.4 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Flooding hazard:* Very Rare  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Loamy Bottom (Basin Big Sagebrush)  
*Potential native vegetation:* basin big sagebrush, basin wildrye, Indian ricegrass, rubber rabbitbrush, Sandberg bluegrass, fourwing saltbush, muttongrass, western wheatgrass  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

C1—0 to 2 inches; fine sandy loam  
 C2—2 to 5 inches; fine sandy loam  
 C3—5 to 8 inches; fine sandy loam  
 C4—8 to 11 inches; very fine sandy loam  
 C5—11 to 19 inches; fine sand  
 C6—19 to 45 inches; stratified fine sandy loam to loam  
 C7—45 to 60 inches; fine sand

#### Suwanee, saline soils

*Landform:* Flood plains  
*Parent material:* Mixed recent alluvium  
*Slope:* 0 to 5 percent  
*Surface fragments:* About 1 percent gravel  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 9.4 inches (high)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Flooding hazard:* Very Rare  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 4 mmhos/cm (very slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Alkali Bottom (Greasewood)  
*Potential native vegetation:* greasewood, alkali sacaton, Torrey seepweed, bottlebrush squirreltail, sand dropseed  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 8 inches; loam  
 C1—8 to 16 inches; loam  
 C2—16 to 37 inches; loam  
 C3—37 to 39 inches; loam  
 C4—39 to 45 inches; very fine sandy loam  
 C5—45 to 48 inches; loam  
 C6—48 to 57 inches; fine sandy loam  
 C7—57 to 79 inches; loamy fine sand

#### Escavada soils

*Landform:* Alluvial flats, flood plains  
*Parent material:* Mixed recent alluvium  
*Slope:* 0 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 4.3 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Flooding hazard:* Very Rare  
*Runoff class:* Negligible  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Loamy Bottom (Basin Big Sagebrush)  
*Potential native vegetation:* basin big sagebrush, basin wildrye, Indian ricegrass, rubber rabbitbrush, Sandberg bluegrass, fourwing saltbush, muttongrass, western wheatgrass  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 16 inches; fine sand  
 C1—16 to 29 inches; loamy sand  
 C2—29 to 37 inches; loamy sand  
 2C—37 to 60 inches; extremely cobbly coarse sand

#### Minor Components

Atrac and similar soils  
*Composition:* About 10 percent  
*Landform:* Alluvial flats  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)  
 Riverwash

*Composition:* About 5 percent  
*Landform:* Channels  
*Drainage class:* Poorly drained  
*Flooding hazard:* Very Frequent

Green River and similar soils

*Composition:* About 5 percent  
*Landform:* Channels, flood plains  
*Drainage class:* Moderately well drained  
*Ecological site:* Semiwet Saline Streambank  
 (Fremont Cottonwood)

## 5142—Alvey-Atrac complex, 1 to 15 percent slopes

### Map Unit Setting

*Elevation:* 5,600 to 6,500 feet (1,707 to 1,982 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southwest of the town of Escalante, in Alvey Wash, Little Valley, and Long Flat, west of the town of Escalante along Highway 12, and north of the town of Henrieville on Coal Bench. Also located south of the town of Henrieville near Kodachrome Basin State Park in the Little Dry Valley, southeast of the town of Henrieville along the Cockscomb in the Round Valley drainage, Wahweap Creek on Long Flat and flats near the south side of Horsemountain.

*Geology:* Alluvium from Kaiparowits Formation (Kk); Wahweap Formation, Lower Member (Kwl)

### Map Unit Composition

Alvey and similar soils: 55 percent

Atrac and similar soils: 30 percent

Minor components: 15 percent

### Component Descriptions

#### Alvey soils

*Landform:* Alluvial flats, fan remnants  
*Parent material:* Mixed alluvium  
*Slope:* 1 to 15 percent  
*Surface fragments:* About 2 percent gravel  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 10.5 inches (high)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 45 percent  
*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 2 inches; very fine sandy loam  
 AB—2 to 11 inches; sandy clay loam  
 Btk1—11 to 35 inches; clay loam  
 Btk2—35 to 50 inches; clay loam  
 C—50 to 60 inches; clay loam

#### Atrac soils

*Landform:* Fan remnants

*Parent material:* Mixed alluvium

*Slope:* 1 to 15 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 9.5 inches (high)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 19 inches; very fine sandy loam  
 Bw—19 to 29 inches; loam  
 C—29 to 60 inches; very fine sandy loam

#### Minor Components

Radnik, moist and similar soils

*Composition:* About 8 percent

*Landform:* Flood plains

*Drainage class:* Well drained

*Ecological site:* Loamy Bottom (Basin Big Sagebrush)

Fine-loamy Ustic Haplocalcids and similar soils

*Composition:* About 5 percent

*Landform:* Fan remnants

*Drainage class:* Well drained

Sandy Ustic Torriorthents and similar soils

*Composition:* About 2 percent

*Landform:* Channel

*Drainage class:* Well drained

### 5143—Elias-Mikim complex, 1 to 7 percent slopes

#### Map Unit Setting

*Elevation:* 5,700 to 6,300 feet (1,738 to 1,921 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southeast of Cannonville, near Kodachrome Basin State Park and southeast of the town of Escalante, along the Hole-in-the-Rock Road on the south side of Fiftymile Mountain.

*Geology:* Mixed alluvium

#### Map Unit Composition

Elias and similar soils: 55 percent

Mikim and similar soils: 35 percent

Minor components: 10 percent

#### Component Descriptions

##### Elias soils

*Landform:* Stream terraces

*Parent material:* Mixed alluvium

*Slope:* 1 to 4 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 8.4 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* About 5 percent

*Salinity maximum:* About 20 mmhos/cm (strongly saline)

*Sodium adsorption ratio maximum:* About 30 (strongly sodic)

*Ecological site:* Alkali Flat (Greasewood)

*Potential native vegetation:* greasewood, bottlebrush squirreltail, Indian ricegrass, alkali sacaton, basin big sagebrush, galleta, globemallow, sand dropseed, shadscale

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

AE—0 to 2 inches; fine sandy loam

Btn—2 to 6 inches; clay loam

Btkn—6 to 11 inches; loam

Bkn1—11 to 13 inches; fine sandy loam

Bkn2—13 to 32 inches; very fine sandy loam

Bkn3—32 to 34 inches; stratified fine sandy loam to loam

Bk—34 to 63 inches; fine sandy loam

##### Mikim soils

*Landform:* Stream terraces

*Parent material:* Mixed alluvium

*Slope:* 2 to 7 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.5 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* About 2 percent

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 4 inches; fine sandy loam

C1—4 to 7 inches; fine sandy loam

C2—7 to 15 inches; loam

C3—15 to 25 inches; very fine sandy loam

C4—25 to 28 inches; loam

C5—28 to 33 inches; fine sandy loam

C6—33 to 42 inches; loam

C7—42 to 63 inches; fine sandy loam

##### Minor Components

Radnik, moist and similar soils

*Composition:* About 4 percent

*Landform:* Stream terraces

*Drainage class:* Well drained

*Ecological site:* Loamy Bottom (Basin Big Sagebrush)

Coarse-loamy Ustic Torriorthents and similar soils

*Composition:* About 3 percent

*Landform:* Stream terraces

*Drainage class:* Well drained

Suwanee, saline and similar soils

*Composition:* About 3 percent

*Landform:* Stream terraces

*Drainage class:* Well drained

*Ecological site:* Alkali Bottom (Greasewood)

### 5144—Tsaya-Rock outcrop (Straight Cliffs Formation) complex, 10 to 60 percent slopes

#### Map Unit Setting

*Elevation:* 4,700 to 5,700 feet (1,433 to 1,738 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located northeast of the town of Big Water, in the Burning Hills area of the Kaiparowits Plateau.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Lower Member (Ksl)

#### Map Unit Composition

Tsaya and similar soils: 65 percent

Straight Cliffs Formation Burnt Sandstone Rock outcrop: 25 percent

Minor components: 10 percent

#### Component Descriptions

##### Tsaya soils

*Landform:* Hillslopes on structural benches

*Parent material:* Residuum, slope alluvium

*Slope:* 10 to 60 percent

*Surface fragments:* About 10 percent gravel, about 60 percent channers, about 10 percent flagstones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Shallow Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Cutler Mormon tea, galleta, Indian ricegrass

*Land capability subclass (nonirrigated):* 7s

##### Typical Profile:

A—0 to 2 inches; extremely channery loam

C1—2 to 8 inches; very channery loam

C2—8 to 13 inches; extremely channery loam

R—13 inches; bedrock

### Straight Cliffs Formation Burnt Sandstone Rock outcrop

*Landform:* High hills, hillslopes

*Slope:* 10 to 100 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Minor Components

Loamy shallow Typic Torriorthents and similar soils

*Composition:* About 10 percent

*Landform:* Hillslopes, high hills

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

### 5146—Moffat-Pagina-Sheppard complex, 2 to 20 percent slopes

#### Map Unit Setting

*Elevation:* 3,500 to 4,500 feet (1,067 to 1,372 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located northeast of the town of Big Water in Rock Creek Bay and Little Valley.

*Geology:* Entrada Sandstone (Je); Upper Carmel Formation (Jcu)

#### Map Unit Composition

Moffat and similar soils: 50 percent

Pagina and similar soils: 20 percent

Sheppard and similar soils: 15 percent

Minor components: 15 percent

#### Component Descriptions

##### Moffat soils

*Landform:* Plains on structural benches

*Parent material:* Alluvium, eolian sand

*Slope:* 2 to 15 percent

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 6.3 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate maximum:* About 20 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 4 inches; loamy fine sand

Bw—4 to 13 inches; fine sandy loam

Bk1—13 to 36 inches; sandy loam

Bk2—36 to 60 inches; sandy loam

**Pagina soils**

*Landform:* Low hills on structural benches

*Parent material:* Eolian sand, mixed alluvium

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, Fremont indigobush, galleta

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 6 inches; loamy fine sand

Bw—6 to 17 inches; fine sandy loam

Bk—17 to 35 inches; fine sandy loam

Cr—35 to 57 inches; weathered bedrock

**Sheppard soils**

*Landform:* Dunes on structural benches

*Parent material:* Eolian sand

*Slope:* 8 to 20 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Sand (Sand Sagebrush)

*Potential native vegetation:* Indian ricegrass, sand

dropseed, sand sagebrush, Cutler Mormon tea, fourwing saltbush, gooseberryleaf globemallow, sand buckwheat, sandhill muhly

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 1 inch; fine sand

C—1 to 60 inches; fine sand

**Minor Components**

Loamy Lithic Torriorthents and similar soils

*Composition:* About 8 percent

*Landform:* Low hills on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

Loamy-skeletal Lithic Torriorthents and similar soils

*Composition:* About 7 percent

*Landform:* Low hills on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

**5149—Tsaya, saline-Rock outcrop (Straight Cliffs Formation)-Lithic Torriorthents complex, 50 to 80 percent slopes**

**Map Unit Setting**

*Elevation:* 4,300 to 5,600 feet (1,311 to 1,707 meters)

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)

*Frost-free period:* 160 to 190 days

*Note:* Located northeast of the town of Big Water, along the escarpment of Smoky Mountain.

*Geology:* Straight Cliffs Formation, Drip Tank Member (Ksd); Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Lower Member (Ksl)

**Map Unit Composition**

Tsaya, saline and similar soils: 35 percent

Straight Cliffs Formation Rock outcrop: 30 percent

Lithic Torriorthents and similar soils: 25 percent

Minor components: 10 percent

**Component Descriptions**

**Tsaya, saline soils**

*Landform:* Ledges on escarpments

*Parent material:* Residuum, slope alluvium  
*Slope:* 50 to 65 percent  
*Surface fragments:* About 15 percent gravel, about 10 percent cobbles, about 15 percent channers, about 15 percent stones, about 10 percent boulders  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.5 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 4 mmhos/cm (very slightly saline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Desert Shallow Loam (Shadscale)  
*Potential native vegetation:* shadscale, galleta, Indian ricegrass, Nevada Mormon tea, fineleaf hymenopappus, gooseberryleaf globemallow  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 1 inch; very bouldery loam  
 C1—1 to 2 inches; very channery loam  
 C2—2 to 6 inches; very cobbly loam  
 R—6 inches; bedrock

**Straight Cliffs Formation Rock outcrop**

*Landform:* Cliffs on escarpments  
*Slope:* 60 to 140 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

**Lithic Torriorthents soils**

*Landform:* Ledges on escarpments  
*Parent material:* sandstone and shale residuum  
*Slope:* 50 to 80 percent  
*Surface fragments:* About 10 percent gravel, about 30 percent channers, about 5 percent flagstones, about 5 percent boulders  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 1.5 inches (very low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 4 mmhos/cm (very slightly saline)  
*Sodium adsorption ratio maximum:* About 2 (slightly sodic)

*Ecological site:* Desert Shallow Loam (Shadscale)  
*Potential native vegetation:* shadscale, galleta, Indian ricegrass, Nevada Mormon tea, fineleaf hymenopappus, gooseberryleaf globemallow  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 1 inch; sandy loam  
 C—1 to 9 inches; clay loam  
 Cr—9 to 14 inches; weathered bedrock  
 R—14 inches; bedrock

**Minor Components**

Chipeta and similar soils  
*Composition:* About 10 percent  
*Landform:* Ledges on escarpments  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Desert Shallow Clay (Mat Saltbush)

**5150—Chipeta-Hanksville-Badland (Tropic Shale) complex, 2 to 30 percent slopes****Map Unit Setting**

*Elevation:* 3,800 to 4,800 feet (1,159 to 1,463 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located northeast of the town of Big Water, along the base of the Burning Hills and Smoky Mountain and south of the town of Tropic along Bryce Creek.  
*Geology:* Tropic Shale (Kt); with minor amounts of Straight Cliffs Formation, John Henry Member (Ksj); Straight Cliffs Formation, Lower Member (Ksl)

**Map Unit Composition**

Chipeta and similar soils: 45 percent  
 Hanksville and similar soils: 25 percent  
 Tropic Formation Shale Badland: 20 percent  
 Minor components: 10 percent

**Component Descriptions****Chipeta soils**

*Landform:* Hillslopes

*Parent material:* Shale residuum, colluvium from oversteepened badland slopes above the unit

*Slope:* 2 to 30 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 2.0 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 10 percent

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 5 (slightly sodic)

*Ecological site:* Desert Shallow Clay (Mat Saltbush)

*Potential native vegetation:* mat saltbush, galleta, desert trumpet buckwheat

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; silty clay loam

C—3 to 11 inches; silty clay loam

Cr—11 inches; weathered bedrock

**Hanksville soils**

*Landform:* Hillslopes

*Parent material:* Shale residuum

*Slope:* 2 to 30 percent

*Surface fragments:* About 2 percent gravel, about 2 percent channers

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 6.7 inches (moderate)

*Shrink-swell potential:* About 6.5 percent (high)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 10 percent

*Salinity maximum:* About 16 mmhos/cm (moderately saline)

*Sodium adsorption ratio maximum:* About 8 (slightly sodic)

*Ecological site:* Desert Shallow Clay (Mat Saltbush)

*Potential native vegetation:* mat saltbush, galleta, desert trumpet buckwheat

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; silty clay loam

C—3 to 17 inches; silty clay loam

Cyz1—17 to 31 inches; silty clay loam

Cyz2—31 to 38 inches; parachannery silty clay loam

Cr—38 inches; weathered bedrock

**Tropic Formation Shale Badland**

*Slope:* 10 to 80 percent

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Salinity maximum:* About 10 mmhos/cm (moderately saline)

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Billings and similar soils

*Composition:* About 10 percent

*Landform:* Flood plains

*Drainage class:* Well drained

*Ecological site:* Alkali Bottom (Greasewood)

**5151—Pinpoint, dry-Tenneycanyon-Parkwash complex, 2 to 25 percent slopes**

**Map Unit Setting**

*Elevation:* 5,550 to 6,500 feet (1,692 to 1,981 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located under the White Cliffs between Johnson Canyon and the Cockscomb.

*Geology:* Navajo Sandstone (Jn); Kayenta Formation, main body (Jk); Kayenta Formation, Lamb Point Tongue of the Navajo Sandstone (Jnl); Kayenta Formation, Tenney Canyon Tongue (Jkt)

**Map Unit Composition**

Pinpoint, dry and similar soils: 50 percent

Tenneycanyon and similar soils: 30 percent

Parkwash and similar soils: 15 percent

Minor components: 5 percent

**Component Descriptions**

**Pinpoint, dry soils**

*Landform:* Sand sheets on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 15 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 4.4 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Sand (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, mountain big sagebrush, twoneedle pinyon, Indian ricegrass, antelope bitterbrush, bottlebrush squirreltail, sandhill muhly, sixweeks fescue  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 8 inches; loamy fine sand  
 C1—8 to 28 inches; loamy fine sand  
 C2—28 to 54 inches; fine sand  
 C3—54 to 60 inches; fine sand

**Tenneycanyon soils**

*Landform:* Sand sheets on structural benches, hillslopes  
*Parent material:* Eolian sand, residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 5 percent gravel  
*Drainage class:* Excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Available water capacity:* About 4.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Sand (Utah Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, mountain big sagebrush, twoneedle pinyon, Indian ricegrass, antelope bitterbrush, bottlebrush squirreltail, sandhill muhly, sixweeks fescue  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 3 inches; fine sand  
 Bw1—3 to 15 inches; loamy fine sand  
 Bw2—15 to 29 inches; gravelly loamy fine sand  
 E—29 to 52 inches; fine sand  
 E/Bt—52 to 60 inches; fine sand  
 C—60 to 65 inches; gravelly fine sand  
 R—65 inches; bedrock

**Parkwash soils**

*Landform:* Sand sheets and dunes on structural benches  
*Parent material:* Eolian sand, residuum  
*Slope:* 2 to 25 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* Greater than 20 in/hr (very rapid)  
*Available water capacity:* About 1.0 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 2 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Sand (Pinyon-Utah Juniper)  
*Potential native vegetation:* Utah juniper, twoneedle pinyon, Indian ricegrass, green Mormon tea, mountain big sagebrush, pointleaf manzanita, antelope bitterbrush, blue grama, needleandthread  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 2 inches; loamy fine sand  
 C1—2 to 6 inches; fine sand  
 C2—6 to 15 inches; fine sand  
 R—15 inches; bedrock

**Minor Components**

Kayenta Formation Rock outcrop  
*Composition:* About 3 percent  
*Landform:* Structural benches  
 Navajo Sandstone Rock outcrop  
*Composition:* About 2 percent  
*Landform:* Slickrock on structural benches

**5154—Dient-Crotoncanyon complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 4,000 to 5,200 feet (1,220 to 1,585 meters)  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F (11.0 to 14.0 degrees C)  
*Frost-free period:* 160 to 190 days  
*Note:* Located north, west, and east of the town of Big

Water, below the escarpment of Smoky Mountain, Jack Riggs Bench, and Brigham Plains.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Tropic Shale (Kt); Straight Cliffs Formation, Lower Member (Ksl)

### Map Unit Composition

Dient and similar soils: 55 percent  
Crotoncanyon and similar soils: 30 percent  
Minor components: 15 percent

### Component Descriptions

#### Dient soils

*Landform:* Fan remnants

*Parent material:* Alluvium, colluvium

*Slope:* 15 to 50 percent

*Surface fragments:* About 40 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.8 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 4 mmhos/cm (very slightly saline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Stony Loam (Blackbrush)

*Potential native vegetation:* blackbrush, galleta, Torrey Mormon tea, broom snakeweed, fourwing saltbush, shadscale

*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 6 inches; sandy clay loam

C1—6 to 24 inches; cobbly sandy clay loam

C2—24 to 60 inches; extremely cobbly sandy clay loam

#### Crotoncanyon soils

*Landform:* Hillslopes on structural benches

*Parent material:* Residuum, colluvium

*Slope:* 15 to 50 percent

*Surface fragments:* About 30 percent gravel

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 1.1 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Desert Shallow Loam (Shadscale)

*Potential native vegetation:* shadscale, galleta, Indian ricegrass, Nevada Mormon tea, fineleaf hymenopappus, gooseberryleaf globemallow

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 2 inches; gravelly clay loam

Bk—2 to 11 inches; very gravelly clay loam

R—11 inches; bedrock

#### Minor Components

Straight Cliffs Formation Rock outcrop

*Composition:* About 7 percent

*Landform:* Structural benches

Fine-loamy Typic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Fan remnants

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

Loamy Typic Torrfluvents and similar soils

*Composition:* About 3 percent

*Landform:* Channels

*Drainage class:* Somewhat poorly drained

## 5155—Sanostee, warm-Milok-Lazear, warm complex, 2 to 15 percent slopes

### Map Unit Setting

*Elevation:* 4,900 to 5,800 feet (1,494 to 1,768 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located northeast of Big Water, on Smoky Mountain, Burning Hills, Tibbet Bench, and Nipple Bench, on the southern edge of the Kaiparowits Plateau region.

*Geology:* Straight Cliffs Formation, Drip Tank Member (Ksd)

### Map Unit Composition

Sanostee, warm and similar soils: 50 percent

Milok and similar soils: 20 percent

Lazear, warm and similar soils: 15 percent

Minor components: 15 percent

## Component Descriptions

### Sanostee, warm soils

*Landform:* Plains on structural benches  
*Parent material:* Eolian sand, sandstone residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 2 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 5.8 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 8 mmhos/cm (slightly saline)  
*Sodium adsorption ratio maximum:* About 13 (moderately sodic)  
*Ecological site:* Semidesert Sandy Loam (Spiny Hopsage)  
*Potential native vegetation:* spiny hopsage, Cutler Mormon tea, Douglas' dustymaiden, Indian ricegrass, blackbrush, blue grama, galleta, needleandthread, sand dropseed  
*Land capability subclass (nonirrigated):* 5s

#### Typical Profile:

A1—0 to 4 inches; fine sandy loam  
 A2—4 to 9 inches; fine sandy loam  
 Bt—9 to 18 inches; sandy clay loam  
 Btk1—18 to 26 inches; sandy clay loam  
 Btk2—26 to 30 inches; sandy clay loam  
 Ck—30 to 35 inches; sandy clay loam  
 R—35 inches; bedrock

### Milok soils

*Landform:* Plains on structural benches  
*Parent material:* Mixed alluvium, eolian sand  
*Slope:* 4 to 10 percent  
*Surface fragments:* About 2 percent gravel  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.0 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Indian ricegrass, Cutler Mormon tea, fourwing saltbush, galleta, needleandthread

*Land capability subclass (nonirrigated):* 7c

#### Typical Profile:

A—0 to 5 inches; loamy fine sand  
 Bk1—5 to 28 inches; fine sandy loam  
 Bk2—28 to 49 inches; fine sandy loam  
 Bk3—49 to 60 inches; loam

### Lazear, warm soils

*Landform:* Dissected hillslopes on structural benches  
*Parent material:* Sandstone residuum, residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 15 percent gravel  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 0.9 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Sandy Loam (Blackbrush)

*Potential native vegetation:* blackbrush, Bigelow sagebrush, Indian ricegrass, Torrey Mormon tea, galleta

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A1—0 to 4 inches; loamy sand  
 A2—4 to 6 inches; sandy loam  
 C—6 to 11 inches; gravelly sandy loam  
 R—11 inches; bedrock

### Minor Components

Straight Cliffs Formation Rock outcrop

*Composition:* About 10 percent

*Landform:* Structural benches

Loamy-skeletal Lithic Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

## 5156—Daklos, steep-Fourmilebench complex, 15 to 50 percent slopes

### Map Unit Setting

*Elevation:* 5,000 to 6,200 feet (1,524 to 1,890 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located between the towns of Escalante and Big Water, primarily on Horse Flat and Fourmile Bench, in the Kaiparowits Plateau region.

*Geology:* Wahweap Formation, Upper Member (Kwu); Wahweap Formation, Lower Member (Kwl)

### Map Unit Composition

Daklos, steep and similar soils: 55 percent

Fourmilebench and similar soils: 35 percent

Minor components: 10 percent

### Component Descriptions

#### Daklos, steep soils

*Landform:* Structural benches

*Parent material:* Residuum, slope alluvium

*Slope:* 15 to 50 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 10 percent channers, about 15 percent stones, about 15 percent boulders

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.4 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 2 inches; very stony loam

C1—2 to 8 inches; very gravelly loam

C2—8 to 14 inches; very gravelly loam

R—14 inches; bedrock

#### Fourmilebench soils

*Landform:* Structural benches, dipslopes on cuestas

*Parent material:* Residuum, colluvium

*Slope:* 15 to 50 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 15 percent channers, about 15 percent flagstones, about 5 percent boulders

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.4 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 2 inches; extremely flaggy loamy sand

Bt—2 to 7 inches; very flaggy sandy loam

R—7 inches; bedrock

#### Minor Components

Wahweap Formation Rock outcrop

*Composition:* About 7 percent

*Landform:* Ledges on escarpments

Polychrome family and similar soils

*Composition:* About 3 percent

*Landform:* Escarpments

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)

## 5157—Daklos family-Rock outcrop (Wahweap Formation) complex, 50 to 80 percent slopes

### Map Unit Setting

*Elevation:* 5,500 to 6,000 feet (1,677 to 1,829 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located southwest of the town of Escalante, on Horse Flat and Fourmile Bench, in the Kaiparowits Plateau region.

*Geology:* Wahweap Formation, Lower Member (Kwl); Wahweap Formation, Upper Member (Kwu)

#### Map Unit Composition

Daklos family and similar soils: 50 percent

Wahweap Formation Rock outcrop: 35 percent

Minor components: 15 percent

#### Component Descriptions

##### Daklos family soils

*Landform:* Ledges on escarpments

*Parent material:* Slope alluvium, residuum

*Slope:* 50 to 80 percent

*Surface fragments:* About 15 percent gravel, about 15 percent cobbles, about 10 percent stones, about 10 percent boulders

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 6s

##### Typical Profile:

A—0 to 3 inches; very stony loam

C—3 to 11 inches; very cobbly loam

R—11 inches; bedrock

##### Wahweap Formation Rock outcrop

*Landform:* Cliffs on escarpments

*Slope:* 50 to 150 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Minor Components

Sandy-skeletal shallow Ustic Torriorthents and similar soils

*Composition:* About 10 percent

*Landform:* Ledges on escarpments

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

Loamy Lithic Ustic Torriorthents and similar soils

*Composition:* About 5 percent

*Landform:* Ledges on escarpments

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

#### 5158—Mellenthin, moist-Rock outcrop (Moenkopi Formation) complex, 25 to 60 percent slopes

##### Map Unit Setting

*Elevation:* 5,000 to 5,790 feet (1,524 to 1,765 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Kanab, south of Highway 89, along the west side of the Cockscomb on Fivemile Mountain.

*Geology:* Moenkopi Formation, Timpoweap Member (TRmt); Kaibab Formation (Pk)

##### Map Unit Composition

Mellenthin, moist and similar soils: 45 percent  
Timpoweap Member, Moenkopi Formation Rock outcrop: 40 percent

Minor components: 15 percent

##### Component Descriptions

##### Mellenthin, moist soils

*Landform:* Dipslopes of cuestas

*Parent material:* Residuum, colluvium

*Slope:* 25 to 60 percent

*Surface fragments:* About 50 percent channers, about 15 percent flagstones, about 3 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.0 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Black Sagebrush)  
*Potential native vegetation:* black sagebrush, Indian ricegrass, Utah juniper, Mexican cliffrose, blue grama, bottlebrush squirreltail, broom snakeweed, fourwing saltbush, galleta  
*Land capability subclass (nonirrigated):* 6s

**Typical Profile:**

A—0 to 3 inches; extremely cobbly loam  
 Bk1—3 to 7 inches; very cobbly loam  
 Bk2—7 to 12 inches; very cobbly sandy loam  
 R—12 inches; bedrock

**Timpoweap Member, Moenkopi Formation Rock outcrop**

*Landform:* Canyons dissecting cuestas  
*Slope:* 25 to 100 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

**Minor Components**

Lithic Ustic Torriorthents and similar soils  
*Composition:* About 10 percent  
*Landform:* Canyons and escarpments  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
 Ustic Haplocalcids and similar soils  
*Composition:* About 5 percent  
*Landform:* Canyons and hillslopes  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained

**5159—Mellenthin, moist-Bowdish complex, 2 to 30 percent slopes****Map Unit Setting**

*Elevation:* 5,000 to 5,790 feet (1,524 to 1,765 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located east of the town of Kanab, south of

Highway 89, on the west side of the Cockscomb on Fivemile Mountain.

*Geology:* Moenkopi Formation, Timpoweap Member (TRmt); Kaibab Formation (Pk)

**Map Unit Composition**

Mellenthin, moist and similar soils: 60 percent  
 Bowdish and similar soils: 20 percent  
 Minor components: 20 percent

**Component Descriptions****Mellenthin, moist soils**

*Landform:* Dipslopes of cuestas  
*Parent material:* Residuum  
*Slope:* 2 to 30 percent  
*Surface fragments:* About 30 percent gravel, about 20 percent cobbles, about 25 percent channers, about 10 percent stones  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 0.9 inch (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Black Sagebrush)  
*Potential native vegetation:* black sagebrush, Indian ricegrass, Utah juniper, Mexican cliffrose, blue grama, bottlebrush squirreltail, broom snakeweed, fourwing saltbush, galleta  
*Land capability subclass (nonirrigated):* 6s

**Typical Profile:**

A—0 to 4 inches; extremely cobbly loam  
 Bk—4 to 10 inches; very cobbly loam  
 R—10 inches; bedrock

**Bowdish soils**

*Landform:* Dipslopes of cuestas  
*Parent material:* Residuum  
*Slope:* 2 to 30 percent  
*Surface fragments:* About 50 percent gravel, about 15 percent cobbles  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.0 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)  
*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; very gravelly loam  
 Bw—4 to 7 inches; loam  
 Bk1—7 to 15 inches; silt loam  
 Bk2—15 to 21 inches; cobbly silt loam  
 R—21 inches; bedrock

**Minor Components**

Timpoweap Member, Moenkopi Formation Rock outcrop  
*Composition:* About 10 percent  
*Landform:* Dipslope of cuestas  
 Loamy Lithic Ustic Torriorthents and similar soils  
*Composition:* About 10 percent  
*Landform:* Dipslopes of cuesta and escarpments  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained

**5160—Timpoweap-Evpark-Atarque complex, 2 to 15 percent slopes**

**Map Unit Setting**

*Elevation:* 5,790 to 6,300 feet (1,765 to 1,920 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located east of the town of Kanab, south of Highway 89, on Buckskin Mountain.  
*Geology:* Moenkopi Formation, Timpoweap Member (TRmt)

**Map Unit Composition**

Timpoweap and similar soils: 45 percent  
 Evpark and similar soils: 30 percent  
 Atarque and similar soils: 15 percent

Minor components: 10 percent

**Component Descriptions**

**Timpoweap soils**

*Landform:* Dipslopes of cuestas  
*Parent material:* Residuum  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 55 percent gravel, about 10 percent cobbles  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.3 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 3 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Cliffrose)  
*Potential native vegetation:* mountain big sagebrush, Mexican cliffrose, Utah juniper, Indian ricegrass, bottlebrush squirreltail, broom snakeweed, muttongrass, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 5 inches; gravelly fine sandy loam  
 Bt—5 to 13 inches; very cobbly clay loam  
 R—13 inches; bedrock

**Evpark soils**

*Landform:* Dipslopes of cuestas  
*Parent material:* Slope alluvium  
*Slope:* 2 to 8 percent  
*Surface fragments:* About 5 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 5.0 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)  
*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom

snakeweed, muttongrass, needleandthread,  
western wheatgrass

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 5 inches; very fine sandy loam  
Bw—5 to 10 inches; loam  
Bt1—10 to 18 inches; gravelly very fine sandy  
loam  
Bt2—18 to 27 inches; loam  
Bt3—27 to 33 inches; gravelly loam  
R—33 inches; bedrock

**Atarque soils**

*Landform:* Dipslopes of cuestas

*Parent material:* Limestone residuum

*Slope:* 2 to 15 percent

*Surface fragments:* About 30 percent gravel, about 2  
percent cobbles

*Depth to restrictive feature:* 4 to 20 inches to bedrock  
(lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.8 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 3 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah  
Juniper)

*Potential native vegetation:* black sagebrush,  
twoneedle pinyon, Utah juniper, green Mormon tea,  
Indian ricegrass, Mexican cliffrose, Sandberg  
bluegrass, galleta, grassy rockgoldenrod, yellow  
rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 4 inches; gravelly very fine sandy loam  
Bt1—4 to 8 inches; loam  
Bt2—8 to 18 inches; sandy clay loam  
R—18 inches; bedrock

**Minor Components**

Colskel family and similar soils

*Composition:* About 5 percent

*Landform:* Dipslopes of cuestas

*Depth to restrictive feature:* 4 to 20 inches to  
bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Upland Shallow Loam (Pinyon-  
Utah Juniper)

Evpark family and similar soils

*Composition:* About 5 percent

*Landform:* Dipslopes of cuestas

*Depth to restrictive feature:* 20 to 40 inches to  
bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Upland Loam (Mountain Big  
Sagebrush)

**5163—Horsemountain fine sandy loam,  
moist, 2 to 8 percent slopes**

**Map Unit Setting**

*Elevation:* 4,700 to 5,600 feet (1,433 to 1,707 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305  
millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0  
to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located between the towns of Church Wells and  
Kanab, south of Highway 89, in Fivemile Valley  
and north of Highway 89 along Corral Wash.

*Geology:* Moenkopi Formations (TRm)

**Map Unit Composition**

Horsemountain, moist and similar soils: 76 percent

Minor components: 24 percent

**Component Descriptions**

**Horsemountain, moist soils**

*Landform:* Fan remnants, stream terraces

*Parent material:* Alluvium

*Slope:* 2 to 8 percent

*Surface fragments:* About 5 percent gravel, about 2  
percent cobbles

*Depth to restrictive feature:* 8 to 20 inches to indurated  
petrocalcic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.8 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big  
Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush,  
Indian ricegrass, galleta, bottlebrush squirreltail,  
winterfat

*Land capability subclass (nonirrigated): 7s*

*Typical Profile:*

- A—0 to 4 inches; fine sandy loam
- Bt—4 to 11 inches; loam
- Btk—11 to 19 inches; clay loam
- Bkm—19 inches; indurated petrocalcic

**Minor Components**

Strych, moist and similar soils

- Composition:* About 14 percent
- Landform:* Fan remnants, stream terrace remnants
- Slope:* 2 to 8 percent
- Drainage class:* Well drained
- Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

Barx and similar soils

- Composition:* About 10 percent
- Landform:* Alluvial flats
- Drainage class:* Well drained
- Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

**5164—Badland (Chinle Formation)**

**Map Unit Setting**

- Elevation:* 5,500 to 6,500 feet (1,677 to 1,982 meters)
- Note:* Located along the Vermillion Cliffs from east of the town of Kanab to the west side of the Cockscomb near the Paria River. Also located east of the town of Boulder in the Circle Cliffs Area near Horse Canyon.

*Geology:* Chinle Formation, Upper Member (Monitor Butte, Petrified Forest, and Owl Rock Members) (TRcu); Chinle Formation, Petrified Forest Member (TRcp); Chinle Formation, Lower Member (TRcl)

**Map Unit Composition**

Chinle Formation Badland: 95 percent  
Minor components: 5 percent

**Component Descriptions**

**Chinle Formation Badland**

- Slope:* 10 to 100 percent
- Runoff class:* Very high
- Salinity maximum:* About 30 mmhos/cm (strongly saline)
- Land capability subclass (nonirrigated): 8*

**Minor Components**

Remorris and similar soils

- Composition:* About 5 percent

*Landform:* Shale hills, escarpments

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)

**5166—Hillburn, dry-Sazi, moist complex, 2 to 30 percent slopes**

**Map Unit Setting**

- Elevation:* 4,800 to 5,600 feet (1,463 to 1,707 meters)
- Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)
- Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)
- Frost-free period:* 120 to 160 days
- Note:* Located along Highway 89 east of the town of Kanab, from Telegraph Wash to the Paria Movie set.
- Geology:* Moenkopi Formation, Lower Red Member (TRml); Moenkopi Formation, Middle Red Member (TRmm); Moenkopi Formation, Timpoweap Member (TRmt)

**Map Unit Composition**

Hillburn, dry and similar soils: 55 percent  
Sazi, moist and similar soils: 30 percent  
Minor components: 15 percent

**Component Descriptions**

**Hillburn, dry soils**

- Landform:* Structural benches, hillslopes
- Parent material:* Sandstone and shale residuum and colluvium
- Slope:* 2 to 30 percent
- Surface fragments:* About 10 percent gravel, about 5 percent cobbles, about 25 percent channers
- Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)
- Drainage class:* Well drained
- Slowest permeability:* 0.6 to 2.0 in/hr (moderate)
- Available water capacity:* About 0.3 inch (very low)
- Shrink-swell potential:* About 4.5 percent (moderate)
- Runoff class:* Very high
- Calcium carbonate maximum:* About 15 percent
- Gypsum maximum:* None
- Salinity maximum:* About 2 mmhos/cm (nonsaline)
- Sodium adsorption ratio maximum:* About 0 (nonsodic)
- Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)
- Potential native vegetation:* Fremont's mahonia, Utah

juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 2 inches; very channery fine sandy loam  
 C—2 to 4 inches; extremely channery loam  
 R—4 inches; bedrock

**Sazi, moist soils**

*Landform:* Dissected structural benches  
*Parent material:* Eolian sand over residuum  
*Slope:* 2 to 30 percent  
*Surface fragments:* About 2 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 2.4 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)  
*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; loamy fine sand  
 Bw—4 to 7 inches; fine sandy loam  
 Bk—7 to 24 inches; fine sandy loam  
 R—24 inches; bedrock

**Minor Components**

Simel and similar soils  
*Composition:* About 10 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)  
 Moenkopi Formation Rock outcrop  
*Composition:* About 5 percent

*Landform:* Structural benches

**5167—Progresso, cool-Atchee family complex, 2 to 15 percent slopes**

**Map Unit Setting**

*Elevation:* 5,300 to 5,800 feet (1,616 to 1,768 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located east of the town of Kanab, along the north side of Highway 89 along the base of the Vermillion Cliffs.  
*Geology:* Chinle Formation, Lower Member (TRcl); Moenkopi Formation, Upper Red Member (TRmu); Chinle Formation, Upper Member (Monitor Butte, Petrified Forest, and Owl Rock Members) (TRcu)

**Map Unit Composition**

Progresso, cool and similar soils: 45 percent  
 Atchee family and similar soils: 35 percent  
 Minor components: 20 percent

**Component Descriptions**

**Progresso, cool soils**

*Landform:* Alluvial flats at base of cuestas  
*Parent material:* Alluvium  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 20 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 3.0 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 25 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)  
*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

- Ap—0 to 2 inches; sandy loam
- A—2 to 14 inches; sandy loam
- Bt—14 to 24 inches; sandy loam
- Btk—24 to 26 inches; sandy clay loam
- R—26 inches; bedrock

**Atchee family soils**

- Landform:* Dissected dipslopes on small cuestas, structural benches
- Parent material:* Residuum, slope alluvium
- Slope:* 2 to 15 percent
- Surface fragments:* About 35 percent gravel, about 2 percent stones
- Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)
- Drainage class:* Well drained
- Slowest permeability:* 0.6 to 2.0 in/hr (moderate)
- Available water capacity:* About 0.9 inch (very low)
- Runoff class:* Very high
- Calcium carbonate maximum:* About 3 percent
- Gypsum maximum:* None
- Salinity maximum:* About 2 mmhos/cm (nonsaline)
- Sodium adsorption ratio maximum:* About 0 (nonsodic)
- Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)
- Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's mahonia, Indian ricegrass, galleta, roundleaf buffaloberry, twoneedle pinyon, yellow rabbitbrush
- Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

- A—0 to 2 inches; gravelly loamy sand
- C—2 to 8 inches; gravelly sandy clay loam
- Cr—8 to 18 inches; weathered bedrock
- R—18 inches; bedrock

**Minor Components**

## Strych and similar soils

- Composition:* About 12 percent
- Landform:* Stream terrace remnants
- Drainage class:* Well drained
- Ecological site:* Semidesert Stony Loam (Utah Juniper-Pinyon)

## Barx and similar soils

- Composition:* About 8 percent
- Landform:* Alluvial flats
- Drainage class:* Well drained
- Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

**5169—Lazear, steep-Simel-Rock outcrop (Carmel Formation) complex, 20 to 60 percent slopes****Map Unit Setting**

*Elevation:* 4,700 to 5,400 feet (1,433 to 1,646 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located west of the town of Church Wells, on the Cockscomb, along the Cottonwood Road and Cottonwood Creek.

*Geology:* Page Sandstone, Thousand Pockets Tongue (Jpt); Judd Hollow Tongue of Carmel Formation (Jcj); Navajo Sandstone (Jn); Upper Carmel Formation (Jcu); Entrada Sandstone (Je)

**Map Unit Composition**

Simel and similar soils: 35 percent  
 Lazear, steep and similar soils: 35 percent  
 Carmel Formation Rock outcrop: 20 percent  
 Minor components: 10 percent

**Component Descriptions****Lazear, steep soils**

- Landform:* Dissected structural benches
- Parent material:* Residuum
- Slope:* 20 to 60 percent
- Surface fragments:* About 15 percent gravel, about 5 percent cobbles, about 10 percent channers
- Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)
- Drainage class:* Well drained
- Slowest permeability:* 0.6 to 2.0 in/hr (moderate)
- Available water capacity:* About 1.4 inches (very low)
- Shrink-swell potential:* About 4.5 percent (moderate)
- Runoff class:* Very high
- Calcium carbonate maximum:* About 15 percent
- Gypsum maximum:* None
- Salinity maximum:* About 2 mmhos/cm (nonsaline)
- Sodium adsorption ratio maximum:* About 0 (nonsodic)
- Ecological site:* Semidesert Steep Shallow Loam (Utah Juniper-Pinyon)
- Potential native vegetation:* Utah juniper, Utah serviceberry, roundleaf buffaloberry, Indian

ricegrass, twoneedle pinyon, broom snakeweed, galleta, singleleaf ash

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; very gravelly loam  
C—4 to 11 inches; parachannery loam  
R—11 inches; bedrock

**Simel soils**

*Landform:* Structural benches

*Parent material:* Residuum, slope alluvium

*Slope:* 20 to 60 percent

*Surface fragments:* About 20 percent channers

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.3 inches (very low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 25 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)

*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; gravelly fine sandy loam  
C1—3 to 8 inches; loam  
C2—8 to 11 inches; parachannery sandy clay loam  
Cr—11 to 14 inches; weathered bedrock  
R—14 inches; bedrock

**Carmel Formation Rock outcrop**

*Landform:* Structural benches

*Slope:* 20 to 75 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Gerst family and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes, structural benches

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)

Mellenthin and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Loam (Black Sagebrush)

**5170—Lemrac-Simel-Humbug, moist complex, 2 to 20 percent slopes**

**Map Unit Setting**

*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Kanab, along the base of the Vermillion Cliffs from Highway 89 to the Cockscomb. Also located southeast of the town of Cannonville along the Cottonwood Road from the Paria River to the Cockscomb.

*Geology:* Moenkopi Formation, Shnabkaib Member (TRms); Carmel Formation, Winsor Member (Jcw); Moenkopi Formation, Upper Red Member (Trmu)

**Map Unit Composition**

Lemrac and similar soils: 40 percent

Simel and similar soils: 30 percent

Humbug, moist and similar soils: 20 percent

Minor components: 10 percent

**Component Descriptions**

**Lemrac soils**

*Landform:* Small knolls on structural benches

*Parent material:* Gypsum bedrock residuum

*Slope:* 2 to 20 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 14 percent

*Gypsum maximum:* About 80 percent

*Salinity maximum:* About 8 mmhos/cm (slightly saline)

*Sodium adsorption ratio maximum:* About 2 (slightly sodic)

*Ecological site:* Semidesert Shallow Gypsum (Mormon tea)

*Potential native vegetation:* Indian ricegrass, Torrey Mormon tea, broom snakeweed, Brenda's yellow cryptantha, Fremont's mahonia, Mexican cliffrose, Utah juniper, bottlebrush squirreltail, crispleaf buckwheat, galleta, green Mormon tea, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 5s

*Typical Profile:*

A—0 to 3 inches; silt loam

Cy1—3 to 9 inches; loam

Cy2—9 to 22 inches; parachannery sandy loam

Cr—22 inches; weathered bedrock

**Simel soils**

*Landform:* Structural benches

*Parent material:* Residuum

*Slope:* 2 to 20 percent

*Surface fragments:* About 20 percent channers

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.3 inches (very low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 90 percent

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)

*Potential native vegetation:* Fremont's mahonia, Utah juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush, Mexican cliffrose

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 3 inches; loam

C—3 to 10 inches; parachannery loam

Cr—10 to 15 inches; weathered bedrock

R—15 inches; bedrock

**Humbug, moist soils**

*Landform:* Structural benches

*Parent material:* Eolian sand and slope alluvium over residuum

*Slope:* 2 to 20 percent

*Surface fragments:* About 2 percent gravel

*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.2 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate maximum:* About 25 percent

*Gypsum maximum:* About 70 percent

*Salinity maximum:* About 4 mmhos/cm (very slightly saline)

*Sodium adsorption ratio maximum:* About 2 (slightly sodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 3 inches; very fine sandy loam

Bw—3 to 5 inches; very fine sandy loam

Bk—5 to 15 inches; fine sandy loam

Bky—15 to 17 inches; fine sandy loam

By1—17 to 22 inches; fine sandy loam

By2—22 to 44 inches; parachannery fine sandy loam

BCy—44 to 49 inches; very channery fine sandy loam

Cr—49 inches; weathered bedrock

**Minor Components**

Moenkopi and Carmel Formation Rock outcrop

*Composition:* About 8 percent

*Landform:* Escarpments

*Slope:* 10 to 60 percent

Retsabal and similar soils

*Composition:* About 2 percent

*Landform:* Small knolls on structural benches

*Slope:* 2 to 20 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Shallow Gypsum (Mormon tea)

### **5171—Kenzo-Retsabal-Progresso, cool complex, 2 to 30 percent slopes**

#### **Map Unit Setting**

*Elevation:* 5,000 to 6,000 feet (1,524 to 1,829 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 54 degrees F (7.0 to 12.0 degrees C)

*Frost-free period:* 120 to 180 days

*Note:* Located east of the town of Kanab, along the base of the Vermillion Cliffs from Highway 89 to the Cockscomb and southeast of the town of Cannonville near Kodachrome Basin State Park.

*Geology:* Moenkopi Formation, Shnabkaib Member (TRms); Moenkopi Formation, Middle Red Members (TRmm); Carmel Formation, Winsor Member (Jcw)

#### **Map Unit Composition**

Kenzo and similar soils: 35 percent

Retsabal and similar soils: 30 percent

Progresso, cool and similar soils: 25 percent

Minor components: 10 percent

#### **Component Descriptions**

##### **Kenzo soils**

*Landform:* Structural benches

*Parent material:* Residuum

*Slope:* 10 to 30 percent

*Surface fragments:* About 10 percent channers

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.1 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Shallow Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, broom snakeweed, green Mormon tea, Fremont's

mahonia, Indian ricegrass, galleta, roundleaf

buffaloberry, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

##### *Typical Profile:*

A—0 to 4 inches; channery loam

C—4 to 13 inches; loam

R—13 inches; bedrock

##### **Retsabal soils**

*Landform:* Small knolls on structural benches

*Parent material:* Gypsum bedrock residuum

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.9 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* About 80 percent

*Salinity maximum:* About 10 mmhos/cm (moderately saline)

*Sodium adsorption ratio maximum:* About 2 (nonsodic)

*Ecological site:* Semidesert Shallow Gypsum (Mormon tea)

*Potential native vegetation:* Indian ricegrass, Torrey Mormon tea, broom snakeweed, Brenda's yellow cryptantha, Fremont's mahonia, Mexican cliffrose, Utah juniper, bottlebrush squirreltail, crispleaf buckwheat, galleta, green Mormon tea, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

##### *Typical Profile:*

A—0 to 1 inch; loam

Cy—1 to 11 inches; loam

Cr—11 inches; weathered bedrock

##### **Progresso, cool soils**

*Landform:* Small alluvial flats on structural benches

*Parent material:* slope alluvium

*Slope:* 2 to 30 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 4.9 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate maximum:* About 25 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 6 inches; loam

Bt—6 to 13 inches; loam

Btk—13 to 22 inches; loam

C—22 to 29 inches; gravelly sandy loam

R—29 inches; bedrock

**Minor Components**

Humbug, moist and similar soils

*Composition:* About 10 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

**5172—Ruinpoint-Barx complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Elevation:* 5,000 to 5,800 feet (1,524 to 1,768 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located east of the town of Kanab, along the base of the Vermillion Cliffs from Highway 89 to the Cockscomb.

*Geology:* Moenkopi Formation, Shnabkaib Member (TRms); Moenkopi Formation, Lower Red Member (TRml); Moenkopi Formation, Middle Red Member (TRmm)

**Map Unit Composition**

Ruinpoint and similar soils: 55 percent

Barx and similar soils: 40 percent

Minor components: 5 percent

**Component Descriptions**

**Ruinpoint soils**

*Landform:* Alluvial flats on structural benches

*Parent material:* Alluvium

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.6 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* About 4 percent

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 2 inches; silt loam

Bw—2 to 10 inches; silt loam

Bk1—10 to 25 inches; silt loam

Bk2—25 to 60 inches; silt loam

**Barx soils**

*Landform:* Alluvial flats

*Parent material:* Alluvium, reworked eolian material

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 8.6 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 40 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 2 inches; fine sandy loam

Bt—2 to 8 inches; sandy clay loam

Btk—8 to 17 inches; clay loam

Bk1—17 to 30 inches; fine sandy loam

Bk2—30 to 42 inches; loam

Bk3—42 to 61 inches; fine sandy loam

**Minor Components**

Radnik, moist and similar soils

*Composition:* About 5 percent

*Landform:* Alluvial flats  
*Drainage class:* Well drained  
*Ecological site:* Loamy Bottom (Basin Big Sagebrush)

### 5173—Simel-Strych, moist-Kenzo complex, 2 to 20 percent slopes

#### Map Unit Setting

*Elevation:* 4,500 to 5,400 feet (1,372 to 1,646 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 54 degrees F (7.0 to 12.0 degrees C)  
*Frost-free period:* 120 to 180 days  
*Note:* Located east of the town of Kanab along the Cockscomb and southeast of the town of Cannonville along the Cottonwood Road near Sheppard Point, Dry Valley, and Slickrock Bench.  
*Geology:* Moenkopi Formation (TRm); Moenkopi Formation, Lower Red Member (TRml); Carmel Formation, Winsor Member (Jcw); Moenkopi Formation, Timpoweap Member (TRmt)

#### Map Unit Composition

Simel and similar soils: 45 percent  
 Strych, moist and similar soils: 25 percent  
 Kenzo and similar soils: 20 percent  
 Minor components: 10 percent

#### Component Descriptions

##### Simel soils

*Landform:* Structural benches  
*Parent material:* Residuum  
*Slope:* 2 to 20 percent  
*Surface fragments:* About 65 percent channers, about 5 percent flagstones  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 1.1 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Shale (Utah Juniper-Pinyon)  
*Potential native vegetation:* Fremont's mahonia, Utah

juniper, broom snakeweed, galleta, green Mormon tea, Indian ricegrass, Mexican cliffrose, plains pricklypear, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 2 inches; extremely channery loam  
 C1—2 to 6 inches; parachannery silty clay loam  
 C2—6 to 8 inches; very channery loam  
 Cr—8 to 10 inches; weathered bedrock  
 R—10 inches; bedrock

#### Strych, moist soils

*Landform:* Remnant stream terraces  
*Parent material:* Alluvium  
*Slope:* 2 to 15 percent  
*Surface fragments:* About 20 percent gravel, about 1 percent cobbles  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 4.9 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)  
*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat  
*Land capability subclass (nonirrigated):* 5c

#### Typical Profile:

A—0 to 3 inches; gravelly fine sandy loam  
 Bt—3 to 5 inches; loam  
 Btk—5 to 8 inches; gravelly loam  
 Bk1—8 to 25 inches; cobbly fine sandy loam  
 Bk2—25 to 39 inches; very gravelly sandy loam  
 Bk3—39 to 60 inches; very cobbly fine sandy loam

#### Kenzo soils

*Landform:* Escarpments on structural benches  
*Parent material:* Residuum  
*Slope:* 2 to 20 percent  
*Surface fragments:* About 55 percent gravel, about 15 percent cobbles, about 5 percent stones  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 0.9 inch (very low)  
*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high  
*Calcium carbonate maximum:* About 5 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Loam (Utah  
 Juniper-Pinyon)  
*Potential native vegetation:* Utah juniper, broom  
 snakeweed, green Mormon tea, Fremont's  
 mahonia, Indian ricegrass, galleta, roundleaf  
 buffaloberry, twoneedle pinyon, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 2 inches; gravelly loam  
 C—2 to 7 inches; gravelly loam  
 R—7 inches; bedrock

**Minor Components**

Moenkopi Formation Rock outcrop  
*Composition:* About 10 percent  
*Landform:* Dipslopes of cuestras, structural  
 benches

**5174—Strych-Sazi, moist complex, 15 to  
 50 percent slopes**

**Map Unit Setting**

*Elevation:* 4,900 to 5,800 feet (1,494 to 1,768 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305  
 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0  
 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days  
*Note:* Located east of the town of Kanab along the  
 north side of Highway 89, and along the Vermillion  
 Cliffs from Johnson Canyon to the Cockscomb.  
*Geology:* Kayenta Formation, main body (Jk); Chinle  
 Formation, Upper Member (Monitor Butte, Petrified  
 Forest, and Owl Rock Member) (TRcu); Moenave  
 Formation (Jmo)

**Map Unit Composition**

Strych and similar soils: 45 percent  
 Sazi, moist and similar soils: 30 percent  
 Minor components: 25 percent

**Component Descriptions**

**Strych soils**

*Landform:* Remnant stream terraces  
*Parent material:* Alluvium  
*Slope:* 15 to 50 percent

*Surface fragments:* About 20 percent gravel, about 10  
 percent cobbles, about 15 percent channers, about  
 10 percent stones, about 15 percent boulders  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 3.8 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Stony Loam (Utah Juniper-  
 Pinyon)  
*Potential native vegetation:* Indian ricegrass, Utah  
 juniper, galleta, green Mormon tea, roundleaf  
 buffaloberry, Wyoming big sagebrush, broom  
 snakeweed, needleandthread, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 5 inches; extremely bouldery fine sandy  
 loam  
 Bw—5 to 11 inches; very stony loam  
 Bk1—11 to 18 inches; extremely stony fine sandy  
 loam  
 Bk2—18 to 60 inches; very stony fine sandy  
 loam

**Sazi, moist soils**

*Landform:* Structural benches  
*Parent material:* Eolian sand over residuum  
*Slope:* 15 to 30 percent  
*Surface fragments:* About 5 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock  
 (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 3.3 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Loam (Wyoming Big  
 Sagebrush)  
*Potential native vegetation:* Wyoming big sagebrush,  
 Indian ricegrass, galleta, bottlebrush squirreltail,  
 winterfat  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 10 inches; fine sandy loam

Bk—10 to 21 inches; fine sandy loam  
 C1—21 to 29 inches; loamy fine sand  
 C2—29 to 37 inches; loamy fine sand  
 R—37 inches; bedrock

### Minor Components

Chinle Formation Badland

*Composition:* About 10 percent

*Landform:* Structural benches and escarpments

Barx and similar soils

*Composition:* About 10 percent

*Landform:* Small alluvial flats

*Drainage class:* Well drained

*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

Radnik, moist and similar soils

*Composition:* About 5 percent

*Landform:* Small alluvial flats

*Drainage class:* Well drained

*Ecological site:* Loamy Bottom (Basin Big Sagebrush)

## 5180—Pinpoint-Rock outcrop (Navajo Sandstone)-Parkwash complex, 15 to 50 percent slopes

### Map Unit Setting

*Elevation:* 5,250 to 7,870 feet (1,600 to 2,400 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located under the White Cliffs, between Johnson Canyon and the Cockscomb. Also common along the drainages of the Hackberry and the Paria River.

*Geology:* Navajo Sandstone (Jn); with very minor amounts of Judd Hollow Tongue of Carmel Formation (Jcj)

### Map Unit Composition

Pinpoint and similar soils: 40 percent

Navajo Sandstone Rock outcrop: 30 percent

Parkwash and similar soils: 20 percent

Minor components: 10 percent

### Component Descriptions

#### Pinpoint soils

*Note:* In this unit, Pinpoint is a moderately deep soil (20 to 40 inches to bedrock), which is different

than the very deep typical pedon for Pinpoint (Greater than 60 inches)

*Landform:* Sand sheets on structural benches, climbing dunes

*Parent material:* Eolian sand

*Slope:* 15 to 50 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 2.2 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Sand (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush, blue grama, rubber rabbitbrush, sand sagebrush, Gambel oak, Indian ricegrass, broom snakeweed, green Mormon tea, sandhill muhly

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

C1—0 to 6 inches; fine sand

C2—6 to 19 inches; fine sand

C3—19 to 30 inches; fine sand

R—30 inches; bedrock

#### Navajo Sandstone Rock outcrop

*Landform:* Slickrock on structural benches, cliffs

*Slope:* 30 to 100 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Parkwash soils

*Landform:* Sand sheets and dunes on structural benches

*Parent material:* Eolian sand, residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 10 percent gravel, about 5 percent cobbles, about 2 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Sand (Pinyon-Utah Juniper)  
*Potential native vegetation:* Utah juniper, twoneedle pinyon, Indian ricegrass, green Mormon tea, mountain big sagebrush, pointleaf manzanita, antelope bitterbrush, blue grama, needleandthread  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 2 inches; loamy fine sand  
 C1—2 to 10 inches; fine sand  
 C2—10 to 19 inches; fine sand  
 R—19 inches; bedrock

**Minor Components**

Ustifluvents and similar soils  
*Composition:* About 5 percent  
*Landform:* Washes and channels  
 Kayenta Formation Rock outcrop  
*Composition:* About 5 percent  
*Landform:* Structural benches

**5181—Parkelei-Plumasano, moist-Pinepoint complex, 2 to 15 percent slopes**

**Map Unit Setting**

*Elevation:* 5,550 to 7,100 feet (1,692 to 2,165 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located southeast of the town of Cannonville in the area of Rock Springs Bench and southwest of the town of Cannonville along the Skutumpah Road from Sheep Creek to Skutumpah Terrace.  
*Geology:* Carmel Formation, Co-op Creek Limestone Member (Tcc); Carmel Formation, Crystal Creek Member (Jcx); Carmel Formation, Paria River Member (Jcp); Judd Hollow Tongue of Carmel Formation (Jcj); Navajo Sandstone (Jn); Page Sandstone, Thousand Pockets Tongue (Jpt)

**Map Unit Composition**

Parkelei and similar soils: 40 percent  
 Plumasano, moist and similar soils: 25 percent  
 Pinepoint and similar soils: 20 percent  
 Minor components: 15 percent

**Component Descriptions**

**Parkelei soils**

*Landform:* Alluvial flats on structural benches  
*Parent material:* Eolian sand, sandstone alluvium  
*Slope:* 2 to 10 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 10.0 inches (high)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)  
*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass  
*Land capability subclass (nonirrigated):* 6c

*Typical Profile:*

A—0 to 3 inches; fine sandy loam  
 Bw—3 to 7 inches; fine sandy loam  
 Bt1—7 to 13 inches; sandy clay loam  
 Bt2—13 to 30 inches; sandy clay loam  
 Btk1—30 to 34 inches; clay loam  
 Btk2—34 to 44 inches; loam  
 Bk—44 to 61 inches; loam

**Plumasano, moist soils**

*Landform:* Alluvial flats on structural benches  
*Parent material:* Slope alluvium, eolian sand  
*Slope:* 2 to 15 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 5.5 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 3 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)  
*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass

*Land capability subclass (nonirrigated):* 6c

*Typical Profile:*

- A—0 to 4 inches; loamy fine sand
- Bw—4 to 19 inches; fine sandy loam
- C1—19 to 43 inches; loamy fine sand
- C2—43 to 61 inches; fine sand

**Pinepoint soils**

*Landform:* Sand sheets on structural benches

*Parent material:* Eolian sand

*Slope:* 2 to 15 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 4.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Sand (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush, blue grama, rubber rabbitbrush, sand sagebrush, Gambel oak, Indian ricegrass, broom snakeweed, green Mormon tea, sandhill muhly

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

- A—0 to 6 inches; loamy fine sand
- C1—6 to 17 inches; fine sand
- C2—17 to 29 inches; fine sand
- C3—29 to 42 inches; fine sand
- C4—42 to 60 inches; loamy sand

**Minor Components**

Parkwash and similar soils

*Composition:* About 10 percent

*Landform:* Sand sheets and dunes on structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Upland Shallow Sand (Pinyon-Utah Juniper)

Arabrab and similar soils

*Composition:* About 5 percent

*Landform:* Structural benches

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

**5182—Arabrab-Colskel-Rock outcrop (Carmel Formation) complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 5,790 to 7,800 feet (1,765 to 2,378 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located southeast of the town of Cannonville along the margins of Rock Springs Bench. Also located southwest of the town of Cannonville along Skutumpah Road from Sheep Creek to Skutumpah Terrace. Minor areas of Mido-like soils occur on and near Page Sandstone.

*Geology:* Judd Hollow Tongue of Carmel Formation (Jcj); Navajo Sandstone (Jn); Carmel Formation, Paria River Member (Jcp); Page Sandstone, Thousand Pockets Tongue (Jpt)

**Map Unit Composition**

Arabrab and similar soils: 35 percent

Colskel and similar soils: 30 percent

Carmel Formation Rock outcrop: 20 percent

Minor components: 15 percent

**Component Descriptions**

**Arabrab soils**

*Landform:* Structural benches

*Parent material:* Sandstone residuum

*Slope:* 15 to 50 percent

*Depth to restrictive feature:* 6 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.6 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 5 inches; loamy fine sand  
 Bt—5 to 12 inches; loam  
 R—12 inches; bedrock

**Colskel soils***Landform:* Structural benches*Parent material:* Colluvium, residuum*Slope:* 15 to 50 percent*Surface fragments:* About 35 percent channers, about 15 percent flagstones*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)*Drainage class:* Well drained*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)*Available water capacity:* About 0.7 inch (very low)*Shrink-swell potential:* About 4.5 percent (moderate)*Runoff class:* Very high*Calcium carbonate maximum:* About 30 percent*Gypsum maximum:* None*Salinity maximum:* About 2 mmhos/cm (nonsaline)*Sodium adsorption ratio maximum:* About 0 (nonsodic)*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush*Land capability subclass (nonirrigated):* 7s*Typical Profile:*

A—0 to 4 inches; extremely channery sandy loam  
 C—4 to 11 inches; extremely channery loam  
 R—11 inches; bedrock

**Carmel Formation Rock outcrop***Landform:* Structural benches*Slope:* 50 to 150 percent*Runoff class:* Very high*Land capability subclass (nonirrigated):* 8**Minor Components**

Psammets and similar soils

*Composition:* About 10 percent*Landform:* Dunes on structural benches*Drainage class:* Excessively drained*Ecological site:* Semidesert Sand (Fourwing Saltbush)

Brumley and similar soils

*Composition:* About 5 percent*Landform:* Small alluvial flats on structural benches*Drainage class:* Well drained*Ecological site:* Upland Loam (Mountain Big Sagebrush)**5183—Parkwash-Rock outcrop (Navajo Sandstone)-Vessilla complex, 30 to 65 percent slopes****Map Unit Setting***Elevation:* 5,250 to 7,000 feet (1,600 to 2,134 meters)*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)*Frost-free period:* 100 to 120 days*Note:* Located east of Johnson Canyon along the margins of benches in the Pine Point, Skutumpah Terrace, White Cliffs, and Deer Range Point areas.*Geology:* Navajo Sandstone (Jn); Carmel Formation (Jc); Carmel Formation, Co-op Creek Limestone Member (Jcc); Carmel Formation, Crystal Creek Member (Jcx)**Map Unit Composition**

Vessilla and similar soils: 30 percent  
 Navajo Sandstone Rock outcrop: 30 percent  
 Parkwash and similar soils: 30 percent  
 Minor components: 10 percent

**Component Descriptions****Vessilla soils***Landform:* Ledges on escarpments*Parent material:* Sandstone residuum*Slope:* 30 to 65 percent*Surface fragments:* About 40 percent channers*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)*Drainage class:* Well drained*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)*Available water capacity:* About 0.8 inch (very low)*Runoff class:* Very high*Calcium carbonate maximum:* About 15 percent*Gypsum maximum:* None*Salinity maximum:* About 2 mmhos/cm (nonsaline)*Sodium adsorption ratio maximum:* About 0 (nonsodic)*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

- A—0 to 2 inches; channery loam
- C—2 to 6 inches; loam
- Cr—6 to 11 inches; weathered bedrock
- R—11 inches; bedrock

**Navajo Sandstone Rock outcrop**

*Landform:* Escarpments on structural benches

*Slope:* 30 to 100 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Parkwash soils**

*Landform:* Sand sheets and dunes on structural benches

*Parent material:* Eolian sand, residuum

*Slope:* 30 to 45 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 0.9 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 2 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Sand (Pinyon-Utah Juniper)

*Potential native vegetation:* Utah juniper, twoneedle pinyon, Indian ricegrass, green Mormon tea, mountain big sagebrush, pointleaf manzanita, antelope bitterbrush, blue grama, needleandthread

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

- C—0 to 13 inches; loamy fine sand
- R—13 inches; bedrock

**Minor Components**

Carmel Formation Badland

*Composition:* About 10 percent

*Landform:* Hills on structural benches

**5185—Nomrah-Upler complex, 2 to 15 percent slopes**

**Map Unit Setting**

*Elevation:* 6,000 to 7,000 feet (1,829 to 2,134 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located southeast of the town of Cannonville along the Cottonwood Road in the Slick Rock Bench area and around the town of Henrieville. Also located east of the town of Henrieville along Headquarters Valley; west of the town of Cannonville on Bulldog Bench, Sheep Creek Flat, and benches above Indian Hollow; and southwest of the town of Cannonville along the Skutumpah Road in Bullrush Hollow.

*Geology:* Alluvium from Claron Formation (Tcp, Tcw) over Carmel formation (Jc) and Tropic Shale (Kt)

**Map Unit Composition**

Nomrah and similar soils: 55 percent

Upler and similar soils: 35 percent

Minor components: 10 percent

**Component Descriptions**

**Nomrah soils**

*Landform:* Remnant stream terraces

*Parent material:* Alluvium

*Slope:* 2 to 15 percent

*Surface fragments:* About 5 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.9 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Loam (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

- A—0 to 3 inches; loam
- Bw—3 to 6 inches; loam
- Bt—6 to 11 inches; loam
- Btk1—11 to 18 inches; loam
- Btk2—18 to 36 inches; loam
- Bk1—36 to 47 inches; gravelly loam

Bk2—47 to 63 inches; gravelly fine sandy loam

### Upler soils

*Landform:* Remnant stream terraces

*Parent material:* Alluvium

*Slope:* 2 to 15 percent

*Surface fragments:* About 35 percent gravel, about 12 percent cobbles

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Stony Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* Utah juniper, Utah serviceberry, twoneedle pinyon, Gambel oak, Indian ricegrass, alderleaf mountainmahogany, antelope bitterbrush, mountain big sagebrush, muttongrass

*Land capability subclass (nonirrigated):* 6c

#### Typical Profile:

A—0 to 3 inches; very gravelly sandy loam

Bw—3 to 9 inches; gravelly loam

Bk1—9 to 25 inches; extremely gravelly sandy loam

Bk2—25 to 35 inches; extremely gravelly loamy sand

Bk3—35 to 60 inches; extremely gravelly loam

### Minor Components

Petrocalcic Paleustalfs and similar soils

*Composition:* About 10 percent

*Landform:* Remnant stream terraces

*Depth to restrictive feature:* 20 to 40 inches to petrocalcic

*Drainage class:* Well drained

## 5186—Bodot, cool-Sili complex, 2 to 8 percent slopes

### Map Unit Setting

*Elevation:* 6,260 to 7,060 feet (1,909 to 2,152 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located northwest of the town of Cannonville up Little Creek near the Blues, and west of the town of Cannonville on Bulldog Bench, Sheep Creek Flat, and up the Willis Creek drainage. Also located southwest of the town of Cannonville along the Skutumpah Road around Lower Podunk Creek and Meadow Canyon.

*Geology:* Tropic Shale (Kt); Dakota Formation (Kd)

### Map Unit Composition

Bodot, cool and similar soils: 50 percent

Sili and similar soils: 35 percent

Minor components: 15 percent

### Component Descriptions

#### Bodot, cool soils

*Landform:* Flats

*Parent material:* Shale residuum, slope alluvium

*Slope:* 2 to 8 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)

*Available water capacity:* About 6.0 inches (low)

*Shrink-swell potential:* About 7.5 percent (high)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Clay Loam (Low Sagebrush)

*Potential native vegetation:* low sagebrush, Indian ricegrass, western wheatgrass, antelope bitterbrush, blue grama, bottlebrush squirreltail, mountain big sagebrush

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 2 inches; silty clay

Bss—2 to 33 inches; silty clay

Cr—33 inches; weathered shale bedrock

#### Sili soils

*Landform:* Valley bottoms, flats

*Parent material:* Slope alluvium, alluvium

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.6 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass

*Land capability subclass (nonirrigated):* 4c

*Typical Profile:*

A—0 to 2 inches; silty clay loam  
 Bt1—2 to 5 inches; silty clay loam  
 Bt2—5 to 28 inches; clay loam  
 C—28 to 60 inches; clay loam

**Minor Components**

Bodot family and similar soils

*Composition:* About 10 percent  
*Landform:* Alluvial flats  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)

Menefee family and similar soils

*Composition:* About 5 percent  
*Landform:* Dissected structural benches  
*Depth to restrictive feature:* 8 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

**5187—Zigzag-Aridic Ustorthents complex, 15 to 70 percent slopes**

**Map Unit Setting**

*Elevation:* 6,260 to 7,060 feet (1,909 to 2,152 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located north of the town of Henrieville near Coal Bench, and west of the town of Cannonville on Bulldog Bench and Sheep Creek Flat. Also located southwest of the town of Cannonville along the Skutumpah Road along Willis Creek, on Horse Mountain, around Lower Podunk Creek and Lick Wash.

*Geology:* Tropic Shale (Kt); Dakota Formation (Kd);

Entrada Sandstone (Je); Straight Cliffs Formation, John Henry Member (Ksj)

**Map Unit Composition**

Zigzag and similar soils: 55 percent  
 Aridic Ustorthents and similar soils: 30 percent  
 Minor components: 15 percent

**Component Descriptions**

**Zigzag soils**

*Landform:* Hillslopes, escarpments  
*Parent material:* Shale residuum  
*Slope:* 15 to 50 percent  
*Depth to restrictive feature:* 10 to 30 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.06 to 0.2 in/hr (slow)  
*Available water capacity:* About 2.6 inches (very low)  
*Shrink-swell potential:* About 6.5 percent (high)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A1—0 to 3 inches; clay loam  
 A2—3 to 9 inches; clay  
 C—9 to 14 inches; clay  
 Cr1—14 to 30 inches; weathered bedrock  
 Cr2—30 inches; weathered bedrock

**Aridic Ustorthents soils**

*Landform:* Escarpments, hillslopes  
*Parent material:* Colluvium over shale residuum  
*Slope:* 15 to 70 percent  
*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 5 percent flagstones, about 15 percent stones  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 2.5 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 4 inches; extremely stony loam  
 C1—4 to 11 inches; very stony clay loam  
 C2—11 to 22 inches; very stony clay loam  
 Cr—22 inches; weathered bedrock

**Minor Components**

Tropic Shale Badland  
*Composition:* About 10 percent  
*Landform:* Hillslopes  
 Menefee family and similar soils  
*Composition:* About 3 percent  
*Landform:* Dissected structural benches, breaks  
*Depth to restrictive feature:* 8 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
 Bodot and similar soils  
*Composition:* About 2 percent  
*Landform:* Alluvial flats  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Loam (Mountain Big Sagebrush)

**5188—Frandsen loam, 1 to 15 percent slopes**

**Map Unit Setting**

*Elevation:* 7,300 to 7,800 feet (2,226 to 2,378 meters)  
*Mean annual precipitation:* 16 to 20 inches (406 to 508 millimeters)  
*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)  
*Frost-free period:* 70 to 90 days  
*Note:* Located west of the town of Cannonville in the Sheep Creek drainage, northeast of the town of

Henrieville along Highway 12 around the Blues and southwest of the town of Escalante near Death Ridge.

*Geology:* Kaiparowits Formation (Kk); Wahweap Formation, Lower Member (Kwl); Wahweap Formation, Upper Member (Kwu)

**Map Unit Composition**

Frandsen and similar soils: 75 percent  
 Minor components: 25 percent

**Component Descriptions**

**Frandsen soils**

*Landform:* Alluvial flats  
*Parent material:* Alluvium  
*Slope:* 1 to 15 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 10.2 inches (high)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 4 mmhos/cm (very slightly saline)  
*Sodium adsorption ratio maximum:* About 5 (slightly sodic)  
*Ecological site:* Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)  
*Potential native vegetation:* Indian ricegrass, mountain big sagebrush, blue grama, bottlebrush squirreltail, needleandthread, winterfat  
*Land capability subclass (nonirrigated):* 6e

*Typical Profile:*

A1—0 to 4 inches; loam  
 A2—4 to 12 inches; loam  
 C—12 to 44 inches; loam  
 2C—44 to 60 inches; silt loam

**Minor Components**

Frandsen, cool and similar soils  
*Composition:* About 14 percent  
*Landform:* Alluvial flats  
*Slope:* 1 to 15 percent  
*Drainage class:* Well drained  
*Ecological site:* Mountain Loam (Ponderosa Pine)  
 Curecanti family, cool and similar soils  
*Composition:* About 11 percent  
*Landform:* Mountain slopes surrounding the alluvial flats

*Drainage class:* Well drained

### **5189—Widtsoe-Emlin complex, 5 to 25 percent slopes**

#### **Map Unit Setting**

*Elevation:* 7,300 to 8,300 feet (2,226 to 2,530 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)

*Frost-free period:* 70 to 90 days

*Note:* Located east of the town of Henrieville, along Highway 12 around the Blues and from Henderson Canyon southeast to Mud Spring and north of the Skutumpah Road near Horse mountain.

*Geology:* Alluvium from Claron Formation (T<sub>cp</sub>, T<sub>cw</sub>) over Wahweap Formation, Lower Member (K<sub>wl</sub>); Kaiparowits Formation (K<sub>k</sub>); Straight Cliffs Formation, John Henry Member (K<sub>sj</sub>); Wahweap Formation, Upper Member (K<sub>wu</sub>); Straight Cliffs Formation, Lower Member (K<sub>sl</sub>)

#### **Map Unit Composition**

Widtsoe and similar soils: 50 percent

Emlin and similar soils: 40 percent

Minor components: 10 percent

#### **Component Descriptions**

##### **Widtsoe soils**

*Landform:* Remnant stream terraces, fan remnants

*Parent material:* Mixed alluvium

*Slope:* 5 to 25 percent

*Surface fragments:* About 30 percent gravel, about 5 percent cobbles, about 1 percent stones

*Drainage class:* Moderately well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Stony Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* Indian ricegrass, Sandberg bluegrass, antelope bitterbrush, mountain big sagebrush, twoneedle pinyon, James' cryptantha, Utah juniper, black sagebrush, blue grama, bottlebrush squirreltail, needleandthread

*Land capability subclass (nonirrigated):* 6e

##### *Typical Profile:*

A—0 to 10 inches; gravelly sandy loam

Bt—10 to 20 inches; extremely cobbly loam

2Bk1—20 to 52 inches; extremely gravelly loamy sand

2Bk2—52 to 63 inches; very gravelly loamy sand

##### **Emlin soils**

*Landform:* Fan remnants, remnant stream terraces

*Parent material:* Mixed alluvium

*Slope:* 5 to 25 percent

*Surface fragments:* About 1 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.3 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)

*Potential native vegetation:* Indian ricegrass, mountain big sagebrush, blue grama, bottlebrush squirreltail, needleandthread, winterfat

*Land capability subclass (nonirrigated):* 6e

##### *Typical Profile:*

A—0 to 3 inches; loam

Bt1—3 to 8 inches; loam

Bt2—8 to 21 inches; loam

Btk—21 to 35 inches; clay loam

Bk1—35 to 46 inches; loam

Bk2—46 to 60 inches; clay loam

##### **Minor Components**

Widtsoe family and similar soils

*Composition:* About 10 percent

*Landform:* Remnant stream terraces, fan remnants

*Drainage class:* Well drained

*Ecological site:* Upland Stony Loam (Black Sagebrush)

### **5190—Podo-Rock outcrop (Straight Cliffs and Wahweap Formations) complex, 15 to 50 percent slopes**

#### **Map Unit Setting**

*Elevation:* 6,500 to 7,800 feet (1,982 to 2,378 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)

*Frost-free period:* 70 to 90 days

*Note:* Located east of the town of Henrieville, along Highway 12 around the Blues and from Henderson Canyon southeast to Mud Spring and north of the Skutumpah Road near Horse Mountain.

*Geology:* Wahweap Formation, Lower Member (Kwl); Kaiparowits Formation (Kk); Straight Cliffs Formation, John Henry Member (Ksj); Wahweap Formation, Upper Member (Kwu); Straight Cliffs Formation, Lower Member (Ksl)

#### Map Unit Composition

Podo and similar soils: 45 percent

Straight Cliffs and Wahweap Formation Rock outcrop: 40 percent

Minor components: 15 percent

#### Component Descriptions

##### Podo soils

*Landform:* Structural benches, ledges on escarpments

*Parent material:* Colluvium, residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 10 percent gravel, about 2 percent cobbles, about 1 percent channers, about 1 percent flagstones

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.0 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* Indian ricegrass, black sagebrush, twoneedle pinyon, antelope bitterbrush, mountain big sagebrush, Utah juniper, blue grama, needleandthread

*Land capability subclass (nonirrigated):* 7s

##### Typical Profile:

A1—0 to 2 inches; sandy loam

A2—2 to 10 inches; sandy loam

R—10 inches; bedrock

#### Straight Cliffs and Wahweap Formation Rock outcrop

*Landform:* Cliffs on escarpments

*Slope:* 15 to 140 percent

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### Minor Components

Ruko and similar soils

*Composition:* About 10 percent

*Landform:* Structural benches, ledges on escarpments

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Ecological site:* Upland Shallow Clay (Pinyon-Utah Juniper)

Bigpack and similar soils

*Composition:* About 3 percent

*Landform:* Small alluvial flats

*Ecological site:* Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)

Emlin and similar soils

*Composition:* About 2 percent

*Landform:* Small alluvial flats

*Ecological site:* Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)

#### 5191—Ruko-Rock outcrop (Straight Cliffs and Wahweap Formations)-Podo complex, 30 to 70 percent slopes

##### Map Unit Setting

*Elevation:* 6,500 to 7,800 feet (1,982 to 2,378 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)

*Frost-free period:* 70 to 90 days

*Note:* Located northeast of the town of Henrieville, along Highway 12 around the Blues and north of the Skutumpah Road from Sheep Creek Flat to Meadow Canyon.

*Geology:* Wahweap Formation, Lower Member (Kwl); Straight Cliffs Formation, John Henry Member (Ksj); Kaiparowits Formation (Kk); Wahweap Formation, Upper Member (Kwu); Straight Cliffs Formation, Lower Member (Ksl)

### Map Unit Composition

Ruko and similar soils: 50 percent  
 Straight Cliffs and Wahweap Formation Rock outcrop:  
 30 percent  
 Podo and similar soils: 15 percent  
 Minor components: 5 percent

### Component Descriptions

#### Ruko soils

*Landform:* Structural benches, ledges on escarpments  
*Parent material:* Residuum, colluvium  
*Slope:* 30 to 70 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock  
 (paralithic)

*Drainage class:* Well drained  
*Slowest permeability:* 0.06 to 0.2 in/hr (slow)  
*Available water capacity:* About 3.4 inches (low)  
*Shrink-swell potential:* About 7.5 percent (high)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0  
 (nonsodic)

*Ecological site:* Upland Shallow Clay (Pinyon-Utah  
 Juniper)

*Potential native vegetation:* twoneedle pinyon, Indian  
 ricegrass, antelope bitterbrush, black sagebrush,  
 Utah juniper, alderleaf mountainmahogany,  
 bottlebrush squirreltail, roundleaf buffaloberry,  
 western wheatgrass

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 4 inches; clay loam  
 C1—4 to 7 inches; clay  
 C2—7 to 19 inches; clay  
 Cr—19 inches; weathered bedrock

#### Straight Cliffs and Wahweap Formation Rock outcrop

*Landform:* Cliffs on escarpments  
*Slope:* 60 to 140 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

#### Podo soils

*Landform:* Structural benches, ledges on escarpments  
*Parent material:* Colluvium, residuum  
*Slope:* 30 to 70 percent  
*Surface fragments:* About 30 percent channers

*Depth to restrictive feature:* 10 to 20 inches to bedrock  
 (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah  
 Juniper)

*Potential native vegetation:* Indian ricegrass, black  
 sagebrush, twoneedle pinyon, antelope bitterbrush,  
 mountain big sagebrush, Utah juniper, blue grama,  
 needleandthread

*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 4 inches; channery sandy loam  
 C—4 to 17 inches; sandy loam  
 R—17 inches; bedrock

#### Minor Components

Bigpack and similar soils

*Composition:* About 3 percent

*Landform:* Small alluvial flats

*Ecological site:* Upland Loam (Mountain Big  
 Sagebrush-Indian Ricegrass)

Emlin and similar soils

*Composition:* About 2 percent

*Landform:* Small alluvial flats

*Ecological site:* Upland Loam (Mountain Big  
 Sagebrush-Indian Ricegrass)

### 5192—Gerst family-Cannonville-Rock outcrop (Straight Cliffs and Dakota Formation) complex, 20 to 50 percent slopes

#### Map Unit Setting

*Elevation:* 5,000 to 5,800 feet (1,524 to 1,768 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305  
 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0  
 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located northeast and east of the town of  
 Henrieville along Highway 12, northeast of the town  
 of Tropic above East Valley and west of the town

of Cannonville on Sheep Creek Flat and Bulldog Bench.

*Geology:* Straight Cliffs Formation, John Henry Member (Ksj); Tropic Shale (Kt); Kaiparowits Formation (Kk); Dakota Formation (Kd); Wahweap Formation (Kw)

### Map Unit Composition

Gerst family and similar soils: 50 percent  
Cannonville and similar soils: 25 percent  
Straight Cliffs and Dakota Formation Rock outcrop: 15 percent  
Minor components: 10 percent

### Component Descriptions

#### Gerst family soils

*Landform:* Structural benches, hillslopes  
*Parent material:* Colluvium, residuum  
*Slope:* 20 to 50 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 2.1 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 4 mmhos/cm (very slightly saline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)  
*Potential native vegetation:* Indian ricegrass, galleta, roundleaf buffaloberry, shadscale, bottlebrush squirreltail, Utah juniper, black sagebrush, crispleaf buckwheat  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 3 inches; loam  
C—3 to 12 inches; loam  
Cr—12 inches; weathered bedrock

#### Cannonville soils

*Landform:* Hillslopes  
*Parent material:* Shale residuum  
*Slope:* 20 to 50 percent  
*Surface fragments:* About 2 percent gravel  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 1.3 inches (very low)  
*Shrink-swell potential:* About 7.5 percent (high)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 8 mmhos/cm (slightly saline)  
*Sodium adsorption ratio maximum:* About 5 (slightly sodic)  
*Ecological site:* Semidesert Shallow Clay (Shadscale-Utah Juniper)  
*Potential native vegetation:* Indian ricegrass, galleta, roundleaf buffaloberry, shadscale, bottlebrush squirreltail, Utah juniper, black sagebrush, crispleaf buckwheat  
*Land capability subclass (nonirrigated):* 7s

#### Typical Profile:

A—0 to 7 inches; clay  
Cr—7 inches; weathered bedrock

#### Straight Cliffs and Dakota Formation Rock outcrop

*Landform:* Cliffs on escarpments  
*Slope:* 20 to 100 percent  
*Runoff class:* Very high  
*Land capability subclass (nonirrigated):* 8

#### Minor Components

Tropic Formation Shale Badland  
*Composition:* About 9 percent  
*Landform:* Hillslopes and escarpments  
Henrieville and similar soils  
*Composition:* About 1 percent  
*Landform:* Small alluvial flats  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)

### 5193—Badland (Kaiparowits Formation)

#### Map Unit Setting

*Elevation:* 5,100 to 7,800 feet (1,555 to 2,378 meters)  
*Note:* Located northeast and east of the town of Henrieville around the Blues.  
*Geology:* Kaiparowits Formation (Kk)

#### Map Unit Composition

Kaiparowits Formation Badland: 85 percent  
Minor components: 15 percent

#### Component Descriptions

#### Kaiparowits Formation Badland

*Landform:* Hillslopes, breaks, and escarpments

*Slope:* 15 to 150 percent  
*Slowest permeability:* 0.06 to 0.2 in/hr (slow)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Salinity maximum:* About 20 mmhos/cm (strongly saline)  
*Land capability subclass (nonirrigated):* 8

### Minor Components

Podo family and similar soils  
*Composition:* About 10 percent  
*Landform:* Ledges on escarpments  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

Ruko family and similar soils  
*Composition:* About 5 percent  
*Landform:* Ledges on escarpments  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Upland Shallow Clay (Pinyon-Utah Juniper)

## 5195—Henrieville sandy loam, 2 to 8 percent slopes

### Map Unit Setting

*Elevation:* 6,000 to 7,200 feet (1,829 to 2,195 meters)  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)  
*Frost-free period:* 120 to 160 days

*Note:* Located around the town of Henrieville in the area of Kodachrome Basin State Park, in the Sheep Creek drainage and west of the town of Escalante in the Upper Valley drainage.

*Geology:* Mixed alluvium, varying from Entrada Sandstone (Je) to Kaiparowits Formation (Kk)

### Map Unit Composition

Henrieville and similar soils: 85 percent  
 Minor components: 15 percent

### Component Descriptions

#### Henrieville soils

*Landform:* Alluvial flats, stream terraces  
*Parent material:* Alluvium  
*Slope:* 2 to 8 percent

*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 5.4 inches (low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Very low  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, Wyoming big sagebrush, fourwing saltbush, galleta, green Mormon tea  
*Land capability subclass (nonirrigated):* 6e

### Typical Profile:

A—0 to 5 inches; sandy loam  
 C1—5 to 13 inches; sandy loam  
 C2—13 to 24 inches; sandy loam  
 C3—24 to 41 inches; loamy sand  
 C4—41 to 61 inches; loamy sand  
 C5—61 to 69 inches; gravelly loamy sand  
 C6—69 inches; sand

### Minor Components

Mikim and similar soils  
*Composition:* About 10 percent  
*Landform:* Stream terraces and alluvial flats  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)

Riverwash  
*Composition:* About 5 percent  
*Landform:* Stream channels and washes  
*Drainage class:* Poorly drained  
*Flooding hazard:* Very Rare

## 5198—Bigpack clay loam, 1 to 8 percent slopes

### Map Unit Setting

*Elevation:* 6,600 to 7,300 feet (2,012 to 2,225 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)  
*Frost-free period:* 70 to 90 days

*Note:* Located east of the town of Henrieville around the Blues and southwest of the town of Cannonville in the Sheep Creek drainage and around Horse Mountain.

*Geology:* Kaiparowits Formation (Kk); Tropic Shale (Kt)

**Map Unit Composition**

Bigpack and similar soils: 85 percent  
 Minor components: 15 percent

**Component Descriptions****Bigpack soils**

*Landform:* Alluvial flats  
*Parent material:* Alluvium from shale  
*Slope:* 1 to 8 percent  
*Surface fragments:* About 10 percent gravel, about 1 percent cobbles  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 9.4 inches (high)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* About 2 percent  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)  
*Potential native vegetation:* Indian ricegrass, mountain big sagebrush, blue grama, bottlebrush squirreltail, needleandthread, winterfat  
*Land capability subclass (nonirrigated):* 7e

**Typical Profile:**

A—0 to 2 inches; clay loam  
 C1—2 to 12 inches; loam  
 C2—12 to 28 inches; loam  
 C3—28 to 60 inches; loam

**Minor Components**

Emlin and similar soils  
*Composition:* About 10 percent  
*Landform:* Alluvial flats  
*Drainage class:* Well drained  
*Ecological site:* Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)

Frandsen and similar soils  
*Composition:* About 5 percent  
*Landform:* Alluvial flats  
*Drainage class:* Well drained  
*Ecological site:* Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)

**5199—Quagmeier-Parkelei complex, 2 to 30 percent slopes****Map Unit Setting**

*Elevation:* 6,660 to 7,260 feet (2,030 to 2,212 meters)  
*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)  
*Frost-free period:* 100 to 120 days  
*Note:* Located southwest of the town of Cannonville, north of the Skutumpah Road near Indian Hollow, Horse Mountain, Squaw Bench and Meadow Canyon. Also located east of the town of Henrieville near Wiggler Wash.  
*Geology:* Alluvium from Claron Formation (Tcp, Tcw) over Tropic Shale (Kt); Dakota Formation (Kd)

**Map Unit Composition**

Quagmeier and similar soils: 50 percent  
 Parkelei and similar soils: 35 percent  
 Minor components: 15 percent

**Component Descriptions****Quagmeier soils**

*Landform:* Fan remnants  
*Parent material:* Alluvium from sandstone and limestone  
*Slope:* 2 to 30 percent  
*Surface fragments:* About 25 percent gravel, about 15 percent cobbles, about 15 percent stones  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 3.5 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 40 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Stony Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* Utah juniper, Utah serviceberry, twoneedle pinyon, Gambel oak,

Indian ricegrass, alderleaf mountainmahogany, antelope bitterbrush, mountain big sagebrush, muttongrass

*Land capability subclass (nonirrigated):* 4s

*Typical Profile:*

A—0 to 6 inches; extremely stony sandy loam  
Btk—6 to 12 inches; very stony clay loam  
Bk1—12 to 23 inches; extremely stony loam  
Bk2—23 to 30 inches; extremely stony loam  
Bk3—30 to 60 inches; extremely stony loam

**Parkelei soils**

*Landform:* Fan remnants

*Parent material:* Sandstone alluvium, minor amounts of eolian sand

*Slope:* 2 to 10 percent

*Surface fragments:* About 2 percent gravel

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 9.8 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 3 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Loam (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush, Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass

*Land capability subclass (nonirrigated):* 6c

*Typical Profile:*

A—0 to 7 inches; sandy loam  
Bw—7 to 19 inches; loam  
Bt1—19 to 36 inches; loam  
Bt2—36 to 60 inches; sandy clay loam

**Minor Components**

Bodot, cool and similar soils

*Composition:* About 10 percent

*Landform:* Small alluvial flats

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Upland Clay Loam (Low Sagebrush)

Petrocalcic Paleustalfs and similar soils

*Composition:* About 3 percent

*Landform:* Fan remnants

*Depth to restrictive feature:* 20 to 40 inches to petrocalcic

*Drainage class:* Well drained

Sojourn family and similar soils

*Composition:* About 2 percent

*Landform:* Hillslopes

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

**5200—Sojourn family-Retsabal-Colskel complex, 10 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 6,000 to 7,200 feet (1,829 to 2,195 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located between Sheep Creek and Johnson Canyon along the Skutumpah Road corridor.

*Geology:* Carmel Formation, Paria River Member (Jcp); Judd Hollow Tongue of Carmel Formation (Jcj); Page Sandstone, Thousand Pockets Tongue (Jpt); Carmel Formation, Crystal Creek Member (Jcx)

**Map Unit Composition**

Sojourn family and similar soils: 40 percent

Retsabal and similar soils: 25 percent

Colskel and similar soils: 25 percent

Minor components: 10 percent

**Component Descriptions**

**Sojourn family soils**

*Landform:* Hillslopes on structural benches

*Parent material:* Residuum

*Slope:* 10 to 50 percent

*Surface fragments:* About 10 percent gravel, about 10 percent cobbles, about 30 percent channers

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.8 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

A—0 to 5 inches; channery sandy loam

C1—5 to 7 inches; loam

C2—7 to 15 inches; loam

Cr—15 inches; weathered bedrock

**Retsabal soils**

*Landform:* Structural benches

*Parent material:* Gypsum bedrock residuum

*Slope:* 10 to 50 percent

*Surface fragments:* About 3 percent gravel

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.8 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* About 60 percent

*Salinity maximum:* About 10 mmhos/cm (moderately saline)

*Sodium adsorption ratio maximum:* About 2 (nonsodic)

*Ecological site:* Semidesert Shallow Gypsum (Mormon tea)

*Potential native vegetation:* Indian ricegrass, Torrey Mormon tea, broom snakeweed, Brenda's yellow cryptantha, Fremont's mahonia, Mexican cliffrose, Utah juniper, bottlebrush squirreltail, crispleaf buckwheat, galleta, green Mormon tea, twoneedle pinyon, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 2 inches; fine sandy loam

Cy1—2 to 11 inches; fine sandy loam

Cy2—11 to 15 inches; fine sandy loam

Cr—15 inches; weathered bedrock

**Colskel soils**

*Landform:* Hillslopes on structural benches

*Parent material:* Residuum, colluvium

*Slope:* 10 to 50 percent

*Surface fragments:* About 10 percent gravel, about 15

percent cobbles, 10 percent flagstones, about 15 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.8 inch (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 3 inches; very stony loam

C—3 to 8 inches; very gravelly loam

R—8 inches; bedrock

**Minor Components**

Carmel Formation Badland

*Composition:* About 10 percent

*Landform:* Hillslopes, escarpments, and breaks

**5201—Sojourn family-Aridic Ustorthents complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Elevation:* 5,800 to 6,800 feet (1,768 to 2,073 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located between Sheep Creek and Johnson Canyon, along the Skutumpah Road corridor.

*Geology:* Carmel Formation, Winsor Member (Jcw); Carmel Formation, Paria River Member (Jcp); Entrada Sandstone (Je)

**Map Unit Composition**

Sojourn family and similar soils: 60 percent

Aridic Ustorthents and similar soils: 30 percent

Minor components: 10 percent

### Component Descriptions

#### Sojourn family soils

*Landform:* Hillslopes

*Parent material:* Residuum

*Slope:* 15 to 50 percent

*Surface fragments:* About 10 percent gravel, about 5 percent cobbles, about 5 percent stones, about 5 percent boulders

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 0.6 inch (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* black sagebrush, twoneedle pinyon, Utah juniper, green Mormon tea, Indian ricegrass, Mexican cliffrose, Sandberg bluegrass, galleta, grassy rockgoldenrod, yellow rabbitbrush

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 4 inches; loamy sand

C1—4 to 8 inches; channery loamy sand

C2—8 to 10 inches; channery loamy sand

Cr—10 inches; weathered bedrock

#### Aridic Ustorthents soils

*Landform:* Hillslopes

*Parent material:* Residuum, colluvium

*Slope:* 15 to 50 percent

*Surface fragments:* About 30 percent gravel, about 5 percent cobbles, about 2 percent stones

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate maximum:* About 25 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Steep Stony Loam (Utah Juniper-Pinyon)

*Potential native vegetation:* Utah juniper, twoneedle pinyon, roundleaf buffaloberry, Gambel oak, Indian ricegrass, Utah serviceberry, alderleaf mountainmahogany, galleta, grassy rockgoldenrod, green Mormon tea, muttongrass

*Land capability subclass (nonirrigated):* 6s

#### Typical Profile:

A—0 to 4 inches; gravelly loamy sand

C1—4 to 24 inches; loamy sand

C2—24 to 31 inches; loamy sand

C3—31 to 33 inches; channery sandy loam

Cr—33 inches; weathered bedrock

#### Minor Components

Carmel Formation Badland

*Composition:* About 10 percent

*Landform:* Hillslopes, escarpments, and breaks

### 5203—Wiggler-Curecanti family, cool complex, 25 to 65 percent slopes

#### Map Unit Setting

*Elevation:* 6,800 to 8,200 feet (2,073 to 2,500 meters)

*Mean annual precipitation:* 16 to 20 inches (406 to 508 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)

*Frost-free period:* 70 to 90 days

*Note:* 1) Fir and Spruce species exist on this unit on steep north aspects.

2) Located northeast of the town of Henrieville along Highway 12, around the Blues and north of the Skutumpah Road from Squaw Bench to Meadow Canyon.

*Geology:* Kaiparowits Formation (Kk), Straight Cliffs Formation, Lower Member (Ksl); Tropic Shale (Kt)

#### Map Unit Composition

Wiggler and similar soils: 50 percent

Curecanti family, cool and similar soils: 40 percent

Minor components: 10 percent

#### Component Descriptions

#### Wiggler soils

*Landform:* Mountain slopes

*Parent material:* Residuum, colluvium

*Slope:* 25 to 65 percent

*Surface fragments:* About 15 percent gravel, about 20 percent cobbles, about 10 percent stones

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 2.2 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)  
*Potential native vegetation:* Indian ricegrass, black sagebrush, twoneedle pinyon, antelope bitterbrush, mountain big sagebrush, Utah juniper, blue grama, needleandthread  
*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

A—0 to 3 inches; extremely bouldery loam  
 C—3 to 14 inches; loam  
 Cr—14 inches; weathered bedrock

**Curecanti family, cool soils**

*Landform:* Mountain slopes  
*Parent material:* Colluvium, slope alluvium  
*Slope:* 30 to 60 percent  
*Surface fragments:* About 10 percent gravel, about 15 percent cobbles, about 15 percent stones, about 15 percent boulders  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 4.2 inches (low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate maximum:* About 15 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Mountain Stony Loam (Oak)  
*Potential native vegetation:* ponderosa pine, Indian ricegrass, greenleaf manzanita, Rocky Mountain juniper, antelope bitterbrush, black sagebrush, blue grama, mountain big sagebrush, muttongrass  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

Oe—0 to 0.5 inch; moderately decomposed plant material  
 A—0.5 to 8 inches; very stony loam  
 Bw—8 to 19 inches; very stony loam  
 Bt—19 to 28 inches; very stony clay loam  
 Ck—28 to 35 inches; loam

Cr—35 inches; weathered bedrock

**Minor Components**

Frandsen, cool and similar soils  
*Composition:* About 10 percent  
*Landform:* Small alluvial flats  
*Drainage class:* Well drained  
*Ecological site:* Mountain Loam (Ponderosa Pine)

**5205—Curecanti families, cool-Widtsoe complex, 2 to 25 percent slopes**

**Map Unit Setting**

*Elevation:* 7,560 to 8,200 feet (2,303 to 2,500 meters)  
*Mean annual precipitation:* 12 to 20 inches (305 to 508 millimeters)  
*Mean annual air temperature:* 37 to 45 degrees F (3.0 to 7.0 degrees C)  
*Frost-free period:* 60 to 100 days  
*Note:* Located northeast of the town of Henrieville along Highway 12 and south of Canaan Peak.  
*Geology:* Alluvium from Claron Formation (Tcp, Tcw) over Kaiparowits Formation (Kk)

**Map Unit Composition**

Curecanti family and similar soils: 40 percent  
 Curecanti family, cool and similar soils: 25 percent  
 Widtsoe and similar soils: 25 percent  
 Minor components: 10 percent

**Component Descriptions**

**Curecanti family soils**

*Landform:* Remnant stream terraces  
*Parent material:* Alluvium  
*Slope:* 2 to 25 percent  
*Surface fragments:* About 10 percent gravel, about 15 percent cobbles, about 10 percent stones  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 7.0 inches (moderate)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Medium  
*Calcium carbonate maximum:* About 3 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Mountain Stony Loam (Oak)  
*Potential native vegetation:* mountain brome, Gambel oak, Sandberg bluegrass, antelope bitterbrush, muttongrass, mountain big sagebrush  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 7 inches; very stony loam

Bt1—7 to 17 inches; very stony clay loam

Bt2—17 to 60 inches; very stony clay loam

**Curecanti family, cool soils**

*Landform:* Remnant stream terraces

*Parent material:* Alluvium

*Slope:* 2 to 25 percent

*Surface fragments:* About 15 percent gravel, about 15 percent cobbles, about 10 percent stones

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.9 inches (moderate)

*Shrink-swell potential:* About 6.5 percent (high)

*Runoff class:* High

*Calcium carbonate maximum:* About 5 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Mountain Stony Loam (Oak)

*Potential native vegetation:* ponderosa pine, Indian ricegrass, greenleaf manzanita, Rocky Mountain juniper, antelope bitterbrush, black sagebrush, blue grama, mountain big sagebrush, muttongrass

*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

A—0 to 8 inches; very stony loam

Bt1—8 to 19 inches; very stony clay loam

Bt2—19 to 60 inches; very stony clay loam

**Widtsoe soils**

*Landform:* Remnant stream terraces

*Parent material:* Mixed alluvium

*Slope:* 2 to 25 percent

*Surface fragments:* About 25 percent gravel, about 20 percent cobbles, about 10 percent stones

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.2 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Stony Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* Indian ricegrass, Sandberg

bluegrass, antelope bitterbrush, mountain big sagebrush, twoneedle pinyon, James' cryptantha, Utah juniper, black sagebrush, blue grama, bottlebrush squirreltail, needleandthread

*Land capability subclass (nonirrigated):* 6e

*Typical Profile:*

A—0 to 7 inches; very gravelly loam

Bt1—7 to 12 inches; very stony clay loam

Bt2—12 to 23 inches; very stony clay loam

Bk—23 to 63 inches; very stony clay loam

**Minor Components**

Bigpack and similar soils

*Composition:* About 10 percent

*Landform:* Small alluvial flats on remnant stream terraces

*Drainage class:* Well drained

*Ecological site:* Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)

**5206—Upler cobbly loam, 5 to 50 percent slopes****Map Unit Setting**

*Elevation:* 6,000 to 7,160 feet (1,829 to 2,181 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located along the Skutumpah Road from Adams Wash to Bullrush Hollow, southwest of the town of Cannonville on Sheep Creek Flat, and northeast of the town of Henrieville near Death Ridge.

*Geology:* Alluvium from Claron Formation (Tcp, Tcw) over Straight Cliffs Formation, Lower Member (Ksl); Carmel Formation, Paria River Member (Jcp); Dakota Formation (Kd)

**Map Unit Composition**

Upler and similar soils: 85 percent

Minor components: 15 percent

**Component Descriptions****Upler soils**

*Landform:* Remnant stream terraces, hillslopes

*Parent material:* Alluvium

*Slope:* 5 to 50 percent

*Surface fragments:* About 20 percent gravel, about 15 percent cobbles, about 5 percent stones

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.5 inches (moderate)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Stony Loam (Pinyon-Utah Juniper)

*Potential native vegetation:* Utah juniper, Utah serviceberry, twoneedle pinyon, Gambel oak, Indian ricegrass, alderleaf mountainmahogany, antelope bitterbrush, mountain big sagebrush, muttongrass

*Land capability subclass (nonirrigated):* 6c

*Typical Profile:*

A—0 to 8 inches; very cobbly loam

Bw1—8 to 15 inches; stony loam

Bw2—15 to 26 inches; stony loam

Btk—26 to 60 inches; very stony loam

### Minor Components

Aridic Ustorthents and similar soils

*Composition:* About 8 percent

*Landform:* Escarpments, hillslopes

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Upland Very Steep Shallow Loam (Pinyon-Utah Juniper)

Zigzag and similar soils

*Composition:* About 5 percent

*Landform:* Hillslopes, escarpments

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Upland Shallow Loam (Pinyon-Utah Juniper)

Bodot family and similar soils

*Composition:* About 2 percent

*Landform:* Ledges on escarpments

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Upland Loam (Mountain Big Sagebrush)

## 5207—Winetti-Riverwash complex, 2 to 5 percent slopes

### Map Unit Setting

*Elevation:* 6,560 to 6,890 feet (2,000 to 2,100 meters)

*Mean annual precipitation:* 16 to 20 inches (406 to 508 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F (5.6 to 7.2 degrees C)

*Frost-free period:* 70 to 90 days

*Note:* Located in drainages northeast of the town of Henrieville in Henderson Canyon, along Henrieville Creek, and southwest of the town of Tropic along Bryce Creek. Also located along the Skutumpah Road in the Willis Creek and Podunk Creek drainages.

*Geology:* Recent alluvium from Claron Formation (T<sub>cp</sub>, T<sub>cw</sub>) over Tropic Shale (K<sub>t</sub>)

### Map Unit Composition

Winetti and similar soils: 75 percent

Riverwash: 20 percent

Minor components: 5 percent

### Component Descriptions

#### Winetti soils

*Landform:* Drainageways

*Parent material:* Alluvium from sandstone and limestone

*Slope:* 2 to 5 percent

*Surface fragments:* About 10 percent gravel, about 2 percent cobbles, about 3 percent stones

*Drainage class:* Moderately well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Rare

*Runoff class:* Low

*Calcium carbonate maximum:* About 15 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Potential native vegetation:* ponderosa pine, Indian ricegrass, greenleaf manzanita, Rocky Mountain

juniper, antelope bitterbrush, black sagebrush, blue grama, mountain big sagebrush, muttongrass  
*Land capability subclass (nonirrigated):* 6s

*Typical Profile:*

- A—0 to 6 inches; gravelly loam
- C1—6 to 17 inches; gravelly loam
- C2—17 to 60 inches; very cobbly sandy loam

**Riverwash**

*Landform:* Washes in drainageways

*Slope:* 2 to 5 percent

*Drainage class:* Well drained

*Flooding hazard:* Very Rare

*Land capability subclass (nonirrigated):* 8

**Minor Components**

Aridic Ustorthents and similar soils

*Composition:* About 5 percent

*Landform:* Drainageways

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Upland Very Steep Shallow Loam (Pinyon-Utah Juniper)

**5210—Elpedro, moist-Flatnose complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Elevation:* 5,450 to 6,560 feet (1,662 to 2,000 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F (7.0 to 10.5 degrees C)

*Frost-free period:* 100 to 120 days

*Note:* Located along the Skutumpah Road from Skutumpah Terrace to Sheep Creek Flat. Also located northeast of the town of Henrieville along Highway 12.

*Geology:* Alluvium primarily from Carmel Formation, Paria River Member (Jcp)

**Map Unit Composition**

Elpedro, moist and similar soils: 65 percent

Flatnose and similar soils: 25 percent

Minor components: 10 percent

**Component Descriptions**

**Elpedro, moist soils**

*Landform:* Alluvial flats, valley sides

*Parent material:* Alluvium

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.6 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 10 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Upland Loam (Mountain Big Sagebrush)

*Potential native vegetation:* mountain big sagebrush,

Indian ricegrass, blue grama, Gambel oak, antelope bitterbrush, bottlebrush squirreltail, broom snakeweed, muttongrass, needleandthread, western wheatgrass

*Land capability subclass (nonirrigated):* 6e

*Typical Profile:*

A1—0 to 3 inches; silt loam

A2—3 to 9 inches; silt loam

Bw—9 to 20 inches; silt loam

Bt—20 to 46 inches; silt loam

Btk—46 to 63 inches; silty clay loam

**Flatnose soils**

*Landform:* Alluvial flats, drainageways

*Parent material:* Alluvium

*Slope:* 2 to 8 percent

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 9.1 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate maximum:* About 30 percent

*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio maximum:* About 0 (nonsodic)

*Ecological site:* Loamy Bottom (Basin Big Sagebrush)

*Potential native vegetation:* basin big sagebrush, basin

wildrye, Indian ricegrass, rubber rabbitbrush, Sandberg bluegrass, fourwing saltbush, muttongrass, western wheatgrass

*Land capability subclass (nonirrigated):* 7s

*Typical Profile:*

- A1—0 to 3 inches; fine sandy loam
- A2—3 to 8 inches; fine sandy loam
- C1—8 to 15 inches; fine sandy loam
- C2—15 to 19 inches; sandy loam
- C3—19 to 35 inches; very fine sandy loam
- 2C—35 to 60 inches; silty clay loam

**Minor Components**

## Brumley and similar soils

- Composition:* About 5 percent
- Landform:* Alluvial flats
- Drainage class:* Well drained
- Ecological site:* Upland Loam (Mountain Big Sagebrush)

## Plumasano, moist and similar soils

- Composition:* About 4 percent
- Landform:* Alluvial flats
- Drainage class:* Well drained
- Ecological site:* Upland Loam (Mountain Big Sagebrush)

## Hetz and similar soils

- Composition:* About 1 percent
- Landform:* Drainageways
- Drainage class:* Poorly drained
- Flooding hazard:* Occasional
- Ecological site:* Semiwet Fresh Meadow

**5211—Yarts, moist-Sazi, moist complex, 2 to 8 percent slopes****Map Unit Setting**

*Elevation:* 5,770 to 6,460 feet (1,758 to 1,970 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F (7.0 to 11.0 degrees C)

*Frost-free period:* 120 to 160 days

*Note:* Located around the town of Cannonville in drainages along Henrieville Creek, Yellow Creek and Jim Hollow and around the town of Boulder. Also located southeast of the town of Cannonville in drainages around Kodachrome Basin State Park.

*Geology:* Entrada Sandstone (Je); Carmel Formation, Winsor Member (Jcw)

**Map Unit Composition**

Yarts, moist and similar soils: 60 percent  
Sazi, moist and similar soils: 30 percent  
Minor components: 10 percent

**Component Descriptions****Yarts, moist soils**

*Landform:* Plains on structural benches  
*Parent material:* Reworked eolian sand, alluvium  
*Slope:* 2 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 8.9 inches (moderate)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Low  
*Calcium carbonate maximum:* About 10 percent  
*Gypsum maximum:* None  
*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Sandy Loam (Wyoming Big Sagebrush)  
*Potential native vegetation:* Indian ricegrass, needleandthread, Wyoming big sagebrush, fourwing saltbush, galleta, green Mormon tea  
*Land capability subclass (nonirrigated):* 5c

*Typical Profile:*

- A—0 to 5 inches; fine sandy loam
- C1—5 to 46 inches; very fine sandy loam
- C2—46 to 60 inches; gravelly very fine sandy loam

**Sazi, moist soils**

*Landform:* Plains on structural benches,  
*Parent material:* Reworked eolian sand  
*Slope:* 2 to 8 percent  
*Surface fragments:* About 5 percent gravel  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 2.5 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* High  
*Calcium carbonate maximum:* About 30 percent  
*Gypsum maximum:* None

*Salinity maximum:* About 2 mmhos/cm (nonsaline)  
*Sodium adsorption ratio maximum:* About 0 (nonsodic)  
*Ecological site:* Semidesert Loam (Wyoming Big Sagebrush)  
*Potential native vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta, bottlebrush squirreltail, winterfat  
*Land capability subclass (nonirrigated):* 6s  
*Typical Profile:*  
A—0 to 3 inches; fine sandy loam  
Bw—3 to 5 inches; fine sandy loam  
Bk1—5 to 15 inches; fine sandy loam

Bk2—15 to 22 inches; gravelly fine sandy loam  
R—22 inches; bedrock

#### **Minor Components**

Wayneco, dry and similar soils  
*Composition:* About 10 percent  
*Landform:* Structural benches  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Semidesert Shallow Loam (Torrey Mormon tea)



# Use and Management of the Soils

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This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

## Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive land forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

*Capability classes*, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict

the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

*Capability subclasses* are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

## Rangeland

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Rangeland is an important resource in this soil survey area. Perennial grasses, forbs, shrubs, and pinyon and juniper trees are the dominant vegetation.

The rangeland in this survey area has been and continues to be grazed by cattle throughout the year. During the winter months, cattle graze on the lower elevations in the southeastern part of the survey area. Cattle graze during the summer months on the higher elevations in the northern part; and during the fall and spring they graze the southwestern, eastern and central parts. Generally, water for livestock is supplied through spring developments, wells, catchponds, and a few streams. The rangeland in this survey is also used extensively for recreation, including hiking, camping, hunting, and aesthetics.

Much of the rangeland in this survey area has very productive vegetation. However, the current vegetative species populations show the effects of historical grazing overuse and the lack of natural fires in the ecosystem; therefore, some of the open grasslands are covered by big sagebrush, rabbitbrush, and in some cases, invading pinyon and juniper trees. The herbaceous ground cover and grazeable forage may be as little as one-fourth of what it should be, resulting in accelerated erosion. Ground cover and wildlife and livestock forage can be improved using management practices such as planned grazing systems. Use of facilitative practices such as fencing and water developments will also improve ground cover and forage by improving livestock grazing distribution. Some conditions may require accelerated range practices such as brush management, prescribed burning, and/or reseeding with herbaceous plant species. Accelerated practices may be effective only on specific kinds of soils and ecological sites.

Woodland is also an important resource in this survey area. The majority of the forested trees are pinyon and juniper, but small areas of ponderosa pine, aspen, Rocky Mountain juniper, and Douglas fir exist. Climate, exposure, and soils are the primary factors that determine the tree species that occupy a site and growth rates. Generally, ponderosa pine occurs in areas that have elevations of more than 7,800 ft and precipitation greater than 18 inches. Aspen, Douglas fir, and Rocky Mountain juniper occur on north-facing slopes and isolated pockets on Fifty-Mile Mountain and Canaan Peak. Pinyon and juniper are widespread in the survey area. They usually occur as a potential woodland community on stony or shallow slopes or on

shallow areas of topsoil on mesas and benches. Pinyon and juniper are known in the area to invade into deep soils in response to a lack of fire in the ecosystem and poor vegetative cover on these soils. These stands are usually even-aged and less than 100 years old. Slope and aspect also affect tree growth and the way woodland is managed.

The major use of woodland in the survey area is for grazing and recreation. Very little timber is harvested in the area except for some occasional ponderosa pine. Pinyon and juniper stands have been harvested for firewood, fenceposts, and a few Christmas trees. Few pinyon pinenuts are harvested because they are small and produce poorly in the survey area. The watershed conditions of the pinyon and juniper forests have caused problems in this survey area. They produce substantial runoff and sediment, reducing the quality of water leaving the watershed.

Plants growing on rangeland are affected not only by differences in soils but also by differences in the average annual precipitation, temperature, and the length of the growing season. All of these factors influence the kind and amount of vegetation produced. There are four types of climate regimes in the survey area: Mountain, Upland, Semidesert, and Desert.

*Mountain Climatic Regime.* The annual precipitation in this regime ranges from 16 to 20 inches. The precipitation in summer contributes about 45 to 50 percent of the annual total. Plant growth begins about May 1 and ends about August 1, and is stimulated again in late summer and early fall by brief thunderstorms. Mountain ecological sites occur on all exposures and slopes. The elevation ranges from above 7,000 to 8,300 feet. The mean annual air temperature is 42 to 45 degrees F.

Four ecological sites are in the Mountain climatic regime. These sites are Mountain Shallow Loam (Ponderosa Pine) (E47), Mountain Loam (Ponderosa Pine) (E47), Mountain Gravelly Loam (Ponderosa Pine) (E47), and Mountain Stony Loam (Oak) (E47).

*Upland Climatic Regime.* The annual precipitation in this regime ranges from 12 to 16 inches. About 55 percent of the annual precipitation occurs as rain in the summer. The growing season begins about April 20 and ends about October 1. Rains late in the summer and early in the fall stimulate plant growth. Upland sites occur on all exposures and slopes. The elevation ranges from 5,600 to 7,200 feet. The average annual temperature is 45 to 51 degrees F.

Within this survey is an area near Tropic, Utah, which is colder than the rest of the survey area. The Upland climatic regime in this area occurs at an elevation of 6,300 to 8,000 feet. The average annual temperature is 42 to 45 degrees F.

Three ecological sites are in the Upland climatic regime. These sites are Upland Clay (Low Sagebrush), Upland Sand (Mountain Big Sagebrush), and Upland Loam (Mountain Big Sagebrush).

Eleven woodland sites are in the Upland climatic regime. These sites are Upland Shallow Loam (Pinyon-Utah Juniper)(E47), Upland Stony Loam (Pinyon-Utah Juniper)(E47), Upland Shallow Clay (Pinyon-Utah Juniper)(E47), Upland Shallow Loam (Cliffrose), Upland Shallow Loam (Pinyon-Utah Juniper), Upland Stony Loam (Pinyon-Utah Juniper), Upland Sand (Mountain Big Sagebrush-Pinyon), Upland Shallow Sand (Pinyon-Utah Juniper), Upland Steep Stony Loam (Pinyon-Utah Juniper), Upland Very Steep Shallow Loam (Pinyon-Utah Juniper), and Upland Very Steep Stony Loam (Pinyon-Utah Juniper).

*Semidesert Climatic Regime.* The annual precipitation ranges from 9 to 12 inches. About 55 percent of the annual precipitation occurs during the growing season. The growing season begins about April 15 and ends about October 1. Plant growth is stimulated by thunderstorms that occur in late summer and early fall. Semidesert sites occur on all exposures and slopes. The elevation ranges from 4,500 to 6,500 feet. The average annual temperature is 45 to 52 degrees F.

Twenty-one ecological sites are in the Semidesert climatic regime. These sites are Semidesert Sand (Fourwing Saltbush), Semidesert Sandy Loam (Fourwing Saltbush), Semidesert Sandy Loam (Wyoming Big Sagebrush), Semidesert Loam (Wyoming Big Sagebrush), Semidesert Shallow Sand (Cutler Mormontea), Semidesert Shallow Loam (Torrey Mormontea), Semidesert Sandy Loam (Blackbrush), Semidesert Shallow Sandy Loam (Blackbrush), Semidesert Sandy Loam (Spiny Hopsage), Semidesert Shallow Loam (Black Sagebrush), Semidesert Shallow Loam (Galleta-Utah Juniper), Semidesert Stony Loam (Shadscale), Semidesert Shallow Sandy Loam (Shadscale), Semidesert Shallow Clay (Shadscale-Utah Juniper), Semidesert Shallow Sand (Utah Juniper-Pinyon), Semidesert Shallow Loam (Utah Juniper-Pinyon), Semidesert Steep Shallow Loam (Utah Juniper-Pinyon), Semidesert Gravelly Loam (Utah Juniper-Pinyon), Semidesert Shallow Clay (Utah Juniper-Pinyon), Semidesert Stony Loam (Utah Juniper-Pinyon), and Semidesert Shallow Hardpan (Utah Juniper-Pinyon).

*Desert Climatic Regime.* The annual precipitation ranges from 6 to 9 inches. The growing season begins about March 15 and ends around October 15. Desert sites occur on all exposures and slopes. The elevation ranges from 4,100 to 5,500 feet. The average annual temperature is 52 to 57 degrees F. Nine ecological

sites are in the Desert climatic regime. These sites are Desert Sandy Loam (Fourwing Saltbush), Desert Sand (Sand Sagebrush), Desert Sandy Loam (Blackbrush), Desert Stony Loam (Blackbrush), Desert Shallow Sandy Loam (Blackbrush), Desert Shallow Clay (Mat Saltbush), Desert Stony Loam (Shadscale-Bud Sagebrush), Desert Shallow Loam (Shadscale), and Desert Loam (Shadscale).

*Non-climate described areas.* There are several areas in this survey area that extend across climatic regime lines. These areas receive additional moisture as runoff from adjoining sites or from existing water tables. The limitations of the soil, such as rock fragments and the degree of salinity, affect the kind and amount of vegetation in these areas. Most of these areas are in the Desert, Semidesert, and Upland climatic regimes.

Nine ecological sites are in these areas. These sites are Loamy Bottom (Basin Big Sagebrush), Alkali Bottom (Greasewood), Gypsum Hills, Alkali Fan (Castlevally Saltbush), Alkali Flat (Greasewood), Semiwet Fresh Meadow, Semiwet Saline Streambank (Fremont Cottonwood), Semiwet Fresh Streambank (Fremont Cottonwood) and Sandy Bottom (Fourwing Saltbush).

Table 5 shows, for each soil, the ecological site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of the composition for each species. An explanation of the column headings in table 5 follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The soils, hydrology, and vegetation are all related. Each is interrelated and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are available in the local offices of the Natural Resources Conservation Service.

*Total production* is the amount of vegetation that can be expected to grow annually on well-managed rangeland that is supporting the potential natural plant community. It includes all herbaceous vegetation, whether or not it is palatable to grazing animals, and the current year's growth of leaves, twigs, and fruits on woody plants. It does not include the increase in stem

diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperature make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

*Dry weight* is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percentage of air-dry moisture control content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amounts of shade, recent rains, and unseasonable dry periods.

*Characteristic vegetation*—the grasses, forbs, shrubs and trees that make up most of the potential natural plant community on each soil—is listed by common name. Under *composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Similarity index and trend studies have long been used to assess the condition of rangeland. The similarity index is an index of where the current plant

community is in relation to the climax or potential plant community. Trend is a determination of the direction of change in the current plant community and associated soils in relation to the climax plant community. During this soil survey a new assessment procedure was adopted called the rangeland health assessment, which is an attempt to look at how the ecological processes on a site are functioning. Together with soils, vegetation composition, production, similarity index, and trend, this procedure provides a more complete picture of the resource. It provides more complete information for the manager to use in the development of alternatives. Further information about the range similarity index and rangeland trend is available in chapter 4 of the "National Range and Pasture Handbook," which is available in local offices of the Natural Resources Conservation Service.

The objective of range management is to manage all uses, including grazing, so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site or a desired plant community, which is one of the site's potential vegetation states. Such management generally results in the optimum production of vegetation, control of undesirable plants, conservation of water, and control of erosion. Sometimes, however, a desired plant community may be below the potential and still meet the grazing needs, provide wildlife habitat, and protect the soil and water resources.

# Soil Properties

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Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps.

Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics. Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

## Engineering Index Properties

Table 6 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area. Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM and SC; silty and clayey soils as ML, CL, OL, MH, CH and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and

Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

## Physical Properties

Table 7 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 7, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (oven dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at  $1/3$ - or  $1/10$ -bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity ( $K_{sat}$ ). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are

based on soil characteristics observed in the field, particularly structure, porosity and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at  $1/3$ - or  $1/10$ -bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads and other structures and to plant roots. Special design commonly is needed.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition. In table 7 the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Erosion factors are shown in table 7 as the K factor ( $K_w$  and  $K_f$ ) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor  $K_w$  indicates the erodibility of the

whole soil. The estimates are modified by the presence of rock fragments. Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size. Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams.
4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay and fibric soil material.
8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

## Chemical Properties

Table 8 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of groundwater pollution.

*Soil reaction* is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. The new SI units for salinity are decisiemens per meter (dS/m), which are equal to millimhos per centimeter. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

## Soil Features

Table 9 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A restrictive layer is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in

installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

## Water Features

Table 10 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The months in the table indicate the portion of the year in which the feature is most likely to be a concern.

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. Duration is expressed as extremely brief if 0.1 hour to 4 hours, very brief if 4 hours to 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. None means that flooding is not probable; very rare that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); rare that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); occasional that

it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); frequent that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and very frequent that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.



# Classification of the Soils

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The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 11 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

**ORDER.** Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisols.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalfs (*Ud*, meaning humid, plus *alf*, from Alfisols).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalfs*, the suborder of the Alfisols that has a udic moisture regime).

**SUBGROUP.** Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

**FAMILY.** Families are established within a

subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, mesic Typic Hapludalfs.

**SERIES.** The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

## Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1999) and in "Keys to Soil Taxonomy" (USDA, 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each taxonomic unit are described in the section "Detailed Soil Map Units."

### Alvey Series

#### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* alluvial flats, fan remnants

*Parent material:* mixed alluvium and reworked eolian material

*Elevation:* 5,600 to 6,500 feet (1,697 to 1,970 meters)

*Slope:* 1 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Ustic Calciargids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 38 minutes, 51.30 seconds north; longitude 111 degrees, 38 minutes, 26.92 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel

A—0 to 2 inches; brown (10YR 4/3), very fine sandy loam, yellowish brown (10YR 5/4), dry; 18 percent clay; weak fine subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; common very fine and fine roots; few very fine tubular pores; strong effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

AB—2 to 11 inches; brown (10YR 4/3), sandy clay loam, yellowish brown (10YR 5/4), dry; 23 percent clay; moderate fine subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; common very fine and fine tubular pores; strong effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

Btk1—11 to 35 inches; light olive brown (2.5Y 5/3), clay loam, light olive brown (2.5Y 5/4), dry; 33 percent clay; moderate fine subangular blocky structure; firm, hard, sticky, plastic; common distinct clay films on faces of peds; carbonate segregated in soft masses; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Btk2—35 to 50 inches; light olive brown (2.5Y 5/4), clay loam; light yellowish brown (2.5Y 6/3), dry; 35 percent clay; moderate fine subangular blocky structure; firm, hard, sticky, plastic; common distinct clay films on faces of peds; carbonates

segregated in hard masses and disseminated throughout; violent effervescence; strongly alkaline, pH 8.6; clear smooth boundary.

C—50 to 60 inches; light olive brown (2.5Y 5/4), clay loam, light yellowish brown (2.5Y 6/3), dry; 32 percent clay; massive; strong effervescence; strongly alkaline, pH 8.6.

**Range in Characteristics**

*Depth to secondary carbonates:* 6 to 30 inches

*Depth to diagnostic feature:* 11 to 50 inches to argillic horizon; 12 to 39 inches to calcic horizon

*Surface fragments:* 0 to 5 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

A and AB horizons (when present):

*Hue:* 10YR to 2.5Y

*Value:* 4 to 6 dry, 3 to 5 moist

*Chroma:* 2 to 6

Btk horizons:

*Hue:* 10YR to 2.5Y

*Value:* 5 to 8 dry, 4 to 8 moist

*Chroma:* 2 to 6

*Texture:* loam, clay loam and sandy clay loam

*Clay content:* 18 to 35 percent

*Calcium carbonate equivalent:* 15 to 45 percent

**Anasazi Series**

**Setting**

*Local phases:* cool

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* plain on structural bench

*Parent material:* alluvium, eolian sand

*Elevation:* 5,800 to 6,200 feet (1,768 to 1,890 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, mesic Ustic Haplocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 44 minutes, 8.00 seconds, north; longitude 111 degrees, 30 minutes, 10.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel

A1—0 to 3 inches; reddish brown (5YR 4/3), loam, reddish brown (5YR 5/3), dry; 10 percent clay; weak thin platy structure; friable, slightly hard, nonsticky, nonplastic; many very fine and few fine roots; many very fine pores; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

A2—3 to 10 inches; reddish brown (5YR 4/4), loam, reddish brown (5YR 5/4), dry; 12 percent clay; weak fine subangular blocky structure; friable, slightly hard, nonsticky, slightly plastic; many very fine and few fine roots; many very fine pores; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

Bw—10 to 20 inches; yellowish red (5YR 4/6), loam, yellowish red (5YR 5/6), dry; 14 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine roots; many very fine pores; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

Bk—20 to 30 inches; reddish brown (5YR 5/4), gravelly fine sandy loam, light reddish brown (5YR 6/4), dry; 10 percent clay; weak fine subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; few very fine roots; 10 percent carbonate masses throughout; 25 percent gravel; violent effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

R—30 inches; sandstone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Depth to secondary carbonates:* 15 to 20 inches

*Surface fragments:* 5 to 15 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

*Rock fragment content:* 0 to 30 percent, dominantly gravel

A horizon:

*Chroma:* 3 to 5

Bw and Bk horizons:

*Chroma:* 4 to 6

*Clay content:* 8 to 18 percent

*Fragments:* 5 to 30 percent gravel

*Calcium carbonate equivalent:* 10 to 30 percent

**Arabrab Series****Setting**

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* structural bench

*Parent material:* sandstone residuum

*Elevation:* 5,790 to 7,800 feet (1,755 to 2,378 meters)

*Slope:* 2 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

**Taxonomic class**

Loamy, mixed, superactive, mesic Lithic Haplustalfs

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 16 minutes, 20.00 seconds north; longitude 111 degrees, 6 minutes, 20.00 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel, 5 percent channers, and 5 percent flagstones

A—0 to 5 inches; brown (10YR 4/3), fine sandy loam, brown (10YR 5/3), dry; 13 percent clay; moderate medium granular structure; 5 percent gravel; noneffervescent; slightly alkaline, pH 7.6.

AB—5 to 10 inches; brown (10YR 4/4), loam, brown (10YR 6/4), dry; 19 percent clay; weak fine subangular blocky structure; 5 percent gravel and 5 percent channers; noneffervescent; slightly alkaline, pH 7.6.

Bt—10 to 19 inches; brown (7.5YR 4/4), clay loam, brown (7.5YR 5/4), dry; 31 percent clay; moderate fine and medium subangular blocky structure; 10 percent gravel and 2 percent channers; noneffervescent; slightly alkaline, pH 7.8.

R—19 inches; Straight Cliffs Formation sandstone bedrock

**Range in Characteristics**

*Depth to restrictive feature:* 6 to 20 inches to bedrock (lithic)

*Depth to diagnostic feature:* 6 to 19 inches to argillic horizon

*Surface fragments:* 0 to 10 percent gravel, 0 to 10 percent cobbles, 0 to 10 percent channers, and 0 to 10 percent flagstones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 0 to 30 percent, dominantly gravel, cobbles, and channers

A horizon:

*Hue:* 7.5YR, 10YR

*Value:* 5 dry; 3 or 4 moist

*Chroma:* 3 or 4

*Fragments:* 0 to 5 percent gravel

AB and Bw horizons (when present):

*Fragments:* 0 to 10 percent gravel and 0 to 10 percent channers

Bt horizon:

*Value:* 3 to 5 dry; 3 or 4 moist

*Texture:* sandy clay loam, clay loam

*Clay content:* 18 to 35 percent

*Fragments:* 0 to 10 percent gravel, 0 to 10 percent channers

## Arches Series

### Setting

*Local phase:* dry

*Depth class:* very shallow to shallow

*Drainage class:* excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* sand sheet on structural bench

*Parent material:* eolian sand

*Elevation:* 5,100 to 7,000 feet (1,555 to 2,134 meters)

*Slope:* 2 to 40 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Mixed, mesic Lithic Torripsamments

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 34 minutes, 18.70 seconds north; longitude 111 degrees, 27 minutes, 37.95 seconds west; datum: NAD 83

A—0 to 4 inches; brown (7.5YR 5/4), fine sand, light

brown (7.5YR 6/4), dry; 3 percent clay; strong granular structure; loose, loose, nonsticky, nonplastic; few very fine roots; noneffervescent; slightly alkaline, pH 7.4; clear smooth boundary.

C—4 to 16 inches; reddish brown (5YR 4/4), fine sand, reddish brown (5YR 5/4), dry; 3 percent clay; strong granular structure; loose, loose, nonsticky, nonplastic; few very fine and fine roots; noneffervescent; slightly alkaline, pH 7.4; abrupt smooth boundary.

R—16 inches; sandstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Particle-size control section (weighted average):*

*Clay content:* 0 to 8 percent

A horizon:

*Hue:* 5YR or 7.5YR

*Value:* 4 or 5 moist

*Chroma:* 4 to 6, dry or moist

C horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry

*Chroma:* 4 to 6, dry or moist

*Texture:* fine sand, loamy fine sand, fine sandy loam

## Aridic Ustorthents

### Setting

*Depth class:* moderately deep to very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* escarpments, landslide on escarpments, hillslopes

*Parent material:* colluvium and residuum

*Elevation:* 5,800 to 7,060 feet (1,758 to 2,139 meters)

*Slope:* 15 to 70 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Aridic Ustorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 28 minutes, 14.00 seconds north; longitude 111

degrees, 32 minutes, 41.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 5 percent cobbles, 10 percent stones, and 10 percent boulders

A—0 to 7 inches; brown (7.5YR 4/4), very bouldery loam, brown (7.5YR 5/4), dry; 22 percent clay; weak fine and medium granular structure; 10 percent gravel, 10 percent cobbles, 10 percent stones, and 15 percent boulders; slight effervescence; moderately alkaline, pH 8.0.

AC—7 to 15 inches; brown (7.5YR 5/4), stony loam, light brown (7.5YR 6/4), dry; 24 percent clay; weak medium blocky structure; 5 percent gravel, 5 percent cobbles, and 5 percent stones; noneffervescent; moderately alkaline, pH 8.2.

C1—15 to 33 inches; brown (10YR 5/3), gravelly loam, pale brown (10YR 6/3), dry; 25 percent clay; weak fine and medium subangular blocky structure; 20 percent gravel, 5 percent cobbles, and 5 percent stones; noneffervescent; moderately alkaline, pH 8.2.

C2—33 to 60 inches; grayish brown (10YR 5/2), very gravelly clay loam, light brownish gray (10YR 5/2), dry; 30 percent clay; massive; 35 percent gravel and 10 percent cobbles; noneffervescent; moderately alkaline, pH 8.2.

#### Range in Characteristics

*Depth to restrictive feature:* 20 to greater than 60 inches to bedrock (lithic)

*Surface fragments:* 10 to 30 percent gravel, 5 to 15 percent cobbles, 0 to 5 percent flagstones, 2 to 10 percent stones, and 0 to 10 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 10 to 35 percent

*Rock fragment content:* 10 to 75 percent, dominantly gravel, cobbles, and stones

A and AC horizons:

*Hue:* 5YR to 10YR

*Value:* 5 or 6 dry

*Chroma:* 3 or 4, dry or moist

*Fragments:* 0 to 15 percent cobbles, 0 to 15 percent stones, and 0 to 15 percent boulders

C horizons:

*Hue:* 5YR to 10YR

*Value:* 4 or 5 moist

*Chroma:* 3 or 4 moist

*Texture:* gravelly loam, very gravelly clay loam, loamy sand, sandy loam, loam, clay loam

*Fragments:* 0 to 35 percent gravel, 0 to 15 percent

cobbles, 0 to 15 percent parachanners, and 0 to 20 percent stones

## Atarque Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* dipslopes on structural benches

*Parent material:* limestone residuum

*Elevation:* 5,790 to 6,300 feet (1,765 to 1,920 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Loamy, mixed, superactive, mesic Lithic Haplustalfs

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 4 minutes, 18.08 seconds north; longitude 112 degrees, 6 minutes, 5.96 seconds west; datum: NAD 83

*Surface fragments:* 30 percent gravel and 2 percent cobbles

A—0 to 4 inches; brown (7.5YR 4/4), gravelly very fine sandy loam, brown (7.5YR 5/4), dry; 7 percent clay; moderate medium subangular blocky structure; very friable, slightly hard, nonsticky, slightly plastic; many very fine and fine roots; common very fine and fine vesicular pores; 15 percent gravel; noneffervescent; slightly acid, pH 6.4; clear wavy boundary.

Bt1—4 to 8 inches; dark reddish brown (5YR 3/4), loam, yellowish red (5YR 4/6), dry; 19 percent clay; moderate fine subangular blocky structure; friable, slightly hard, nonsticky, slightly plastic; few very fine and common fine, medium, and coarse roots; common very fine and fine tubular pores; 5 percent gravel; noneffervescent; neutral, pH 6.8; clear wavy boundary.

Bt2—8 to 18 inches; yellowish red (5YR 4/6), sandy clay loam, yellowish red (5YR 5/6), dry; 20 percent clay; moderate medium subangular blocky structure; friable, slightly hard, moderately sticky,

moderately plastic; common medium and coarse roots; common very fine tubular pores; 5 percent gravel and 2 percent cobbles; noneffervescent; neutral, pH 6.9; clear wavy boundary.

R—18 inches; limestone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Depth to diagnostic feature:* 2 to 16 inches to argillic horizon

*Surface fragments:* 0 to 35 percent gravel and 0 to 5 percent cobbles

*Particle-size control section (weighted average):*

*Clay content:* 20 to 28 percent

*Rock fragment content:* 5 to 10 percent gravel and cobbles

Bt horizons:

*Value:* 4 or 5 dry; 3 or 4 moist

*Chroma:* 4 to 6, dry or moist

*Clay content:* 18 to 28 percent

*Fragments:* 0 to 10 percent gravel and 0 to 5 percent cobbles

## Atchee Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* dissected structural bench

*Parent material:* colluvium, slope alluvium, residuum

*Elevation:* 5,300 to 6,500 feet (1,616 to 1,970 meters)

*Slope:* 5 to 60 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy-skeletal, mixed, active, calcareous, mesic

Lithic Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 55 minutes, 27.43 seconds north; longitude 111 degrees, 13 minutes, 31.21 seconds west; datum: NAD 83

*Surface fragments:* 30 percent gravel, 10 percent

channers, 10 percent flagstones, and 10 percent stones

A—0 to 1 inch; dark yellowish brown (10YR 4/4), extremely gravelly loamy fine sand, yellowish brown (10YR 5/4), dry; 8 percent clay; moderate thin platy structure; very friable, soft, nonsticky, nonplastic; common fine vesicular pores; 20 percent gravel and 10 percent channers; slight effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

Bw—1 to 4 inches; dark yellowish brown (10YR 4/4), very gravelly fine sandy loam, yellowish brown (10YR 5/4), dry; 11 percent clay; moderate very fine granular and weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; few very fine roots; 40 percent gravel; strong effervescence; moderately alkaline, pH 8.2; abrupt wavy boundary.

C—4 to 12 inches; yellowish brown (10YR 5/4), very gravelly fine sandy loam, light yellowish brown (10YR 6/4), dry; 13 percent clay; massive; very friable, soft, nonsticky, nonplastic; common very fine, fine, and medium and few coarse roots; 40 percent gravel and 20 percent channers; strong effervescence; moderately alkaline, pH 8.2; abrupt wavy boundary.

2Cr—12 to 15 inches; highly weathered siltstone

R—15 inches; very strongly cemented calcareous conglomerate bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 35 percent gravel, 0 to 45 percent channers, 0 to 25 percent flagstones, and 0 to 15 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 5 to 15 percent

*Rock fragment content:* 35 to 50 percent, dominantly gravel and channers

## Atchee Family

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* dissected ledges on escarpments, dipslopes on cuestas and structural benches

*Parent material:* colluvium, slope alluvium, residuum

*Elevation:* 5,300 to 6,800 feet (1,616 to 2,060 meters)

*Slope:* 2 to 80 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy-skeletal, mixed, active, calcareous, mesic  
Lithic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 32 minutes, 12.58 seconds north; longitude 111 degrees, 27 minutes, 11.21 seconds west; datum: NAD 83

*Surface fragments:* 30 percent gravel, 10 percent channers, 10 percent flagstones, and 10 percent stones

A—0 to 3 inches; brown (10YR 4/3), very gravelly sandy loam, brown (10YR 5/3), dry; 10 percent clay; weak thin platy parting to weak fine granular structure; very friable, soft, nonsticky, nonplastic; many very fine, common fine, few medium and coarse roots; many very fine and few fine pores; 15 percent gravel, 15 percent cobbles, 5 percent channers, and 5 percent flagstones; slight effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

C1—3 to 12 inches; yellowish brown (10YR 5/4), very flaggy sandy loam, light yellowish brown (10YR 6/4), dry; 10 percent clay; massive; very friable, soft, nonsticky, nonplastic; many very fine, fine, common medium and few coarse roots; many very fine and few fine pores; 25 percent gravel and 30 percent flagstones; strong effervescence; moderately alkaline, pH 8.4; clear irregular boundary.

C2—12 to 17 inches; yellowish brown (10YR 5/4), very gravelly sandy loam, light yellowish brown (10YR 6/4), dry; 10 percent clay; massive; very friable, soft, nonsticky, nonplastic; common very fine and fine and few medium roots; common very fine and fine pores; 40 percent gravel and 10 percent channers; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

R—17 inches; very strongly cemented calcareous conglomerate bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 35 percent gravel, 0 to 45

percent channers, 0 to 25 percent flagstones, and 0 to 15 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 8 to 21 percent

*Rock fragment content:* 30 to 45 percent, dominantly gravel and channers

## A horizon:

*Hue:* 10YR or 7.5YR

*Value:* 5 dry; 3 or 4 moist

*Chroma:* 3 or 4

*Fragments:* 15 to 25 percent gravel, 0 to 15 percent cobbles, 0 to 5 percent channers, and 0 to 5 percent flagstones

## C horizons:

*Hue:* 10YR to 5Y

*Value:* 6 dry; 5 to 8 moist

*Chroma:* 3 or 4

*Texture:* very gravelly sandy loam, very channery sandy loam, very flaggy sandy loam, sand

*Fragments:* 25 to 40 percent gravel

**Atrac Series****Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* fan remnants

*Parent material:* alluvium

*Elevation:* 5,600 to 6,500 feet (1,707 to 1,982 meters)

*Slope:* 1 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Ustic  
Haplocambids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 38 minutes, 30.36 seconds north; longitude 111 degrees, 37 minutes, 52.10 seconds west; datum: NAD 83

A—0 to 19 inches; brown (10YR 4/3), very fine sandy loam, pale brown (10YR 6/3), dry; 16 percent clay; moderate thick platy structure; slight effervescence; moderately alkaline, pH 8.2.

Bw—19 to 29 inches; light olive brown (2.5Y 5/3), loam, light yellowish brown (2.5Y 6/3), dry; 26 percent clay; massive; violent effervescence; moderately alkaline, pH 8.2.

C—29 to 60 inches; light olive brown (2.5Y 5/4), very fine sandy loam, pale yellow (2.5Y 7/3), dry; 14 percent clay; massive; violent effervescence; moderately alkaline, pH 8.2.

#### Range in Characteristics

*Depth to cambic horizon:* 10 to 20 inches

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

### Baldfield Series

#### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Landform:* valley floor and valley side

*Parent material:* shale residuum and alluvium

*Elevation:* 5,000 to 5,600 feet (1,524 to 1,707 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### Taxonomic class

Fine, smectitic, calcareous, mesic Ustertic  
Torriorthents

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 39 minutes, 37.93 seconds north.; longitude 111 degrees, 31 minutes, 31.35 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel

A—0 to 2 inches; dark grayish brown (2.5Y 4/2), clay, grayish brown (2.5Y 5/2), dry; 45 percent clay; moderate very fine granular structure; very firm, hard, very sticky, very plastic; cracks 1 to 3 centimeters wide extend through horizon; few coarse roots; few fine pores; strong effervescence; strongly alkaline, pH 8.6; abrupt smooth boundary.

C1—2 to 4 inches; dark grayish brown (2.5Y 4/2), clay, grayish brown (2.5Y 5/2), dry; 43 percent clay;

moderate very thin platy structure; very firm, very hard, very sticky, very plastic; cracks 1 to 2 centimeters wide extend through horizon; few coarse roots; few fine pores; strong effervescence; strongly alkaline, pH 8.8; abrupt smooth boundary.

C2—4 to 15 inches; dark grayish brown (2.5Y 4/2), clay, grayish brown (2.5Y 5/2), dry; 43 percent clay; moderate coarse subangular blocky structure; very firm, very hard, very sticky, very plastic; cracks 1 to 2 centimeters wide extend through top 10 inches of horizon; few medium and coarse roots; few fine pores; strong effervescence; strongly alkaline, pH 8.8; gradual wavy boundary.

C3—15 to 60 inches; dark grayish brown (2.5Y 4/2), clay, grayish brown (2.5Y 5/2), dry; 43 percent clay; moderate coarse subangular blocky structure; very firm, very hard, very sticky, very plastic; few fine and medium roots; few fine and medium pores; strong effervescence; strongly alkaline, pH 8.6.

#### Range in Characteristics

*Surface fragments:* 0 to 5 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 35 to 50 percent

A horizon:

*Cracks:* 0 to 3 centimeters wide

C horizons:

*Cracks:* 0 to 2 centimeters wide

*Clay content:* 35 to 50 percent

### Barx Series

#### Setting

*Local phase:* dry

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* alluvial flats, stream terrace remnants, and fan remnants

*Parent material:* alluvium, reworked eolian material

*Elevation:* 5,000 to 7,200 feet (1,524 to 2,195 meters)

*Slope:* 1 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Ustic  
Calcicargids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 41 minutes, 13.00 seconds north; longitude 111 degrees, 33 minutes, 39.00 seconds west; datum: NAD 83

A—0 to 5 inches; brown (7.5YR 4/4), fine sandy loam, brown (7.5YR 5/4), dry; 15 percent clay; weak coarse platy structure; friable, soft; many very fine and fine and few medium roots; common very fine and fine and few medium pores; slight effervescence; slightly alkaline, pH 7.8; clear smooth boundary.

Bt—5 to 12 inches; reddish brown (5YR 4/4), sandy clay loam, yellowish red (5YR 5/6), dry; 25 percent clay; moderate subangular blocky structure; friable, hard, slightly sticky, slightly plastic; few very fine and medium and common fine roots; common very fine and fine and few medium pores; common distinct clay films on faces of pedis; slight effervescence; moderately alkaline, pH 7.9; clear wavy boundary.

Bw—12 to 31 inches; yellowish red (5YR 4/6), sandy loam, reddish yellow (5YR 6/6), dry; 15 percent clay; weak medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, and medium roots; many very fine, fine, and common medium pores; strong effervescence; moderately alkaline, pH 8.1; clear smooth boundary.

Bk—31 to 48 inches; reddish brown (5YR 5/4), sandy loam, light reddish brown (5YR 6/4), dry; 15 percent clay; massive; friable, slightly hard; few very fine, fine, and medium roots; common very fine and fine and few medium pores; carbonates are disseminated throughout and segregated in veins; strong effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

C—48 to 60 inches; reddish brown (5YR 5/4), sandy loam, light reddish brown (5YR 6/4), dry; 15 percent clay; massive; friable, soft; few very fine and fine roots; few very fine and fine pores; strong effervescence; moderately alkaline, pH 8.4.

**Range in Characteristics**

*Depth to secondary carbonates:* 6 to 30 inches  
*Depth to diagnostic feature:* 2 to 20 inches to argillic horizon

*Surface fragments:* 0 to 5 percent gravel  
*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

A horizon:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 2 to 6

Bw horizon, when present:

*Hue:* 5YR or 7.5YR

*Chroma:* 3 to 6

*Texture:* fine sandy loam, sandy loam, loam

Bt and Btk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 4 to 6 dry; 4 or 5 moist

*Chroma:* 4 to 6

*Texture:* sandy clay loam, clay loam, loam, silt loam

*Clay content:* 18 to 35 percent

*Fragments:* 0 to 15 percent gravel

*Calcium carbonate equivalent:* 1 to 15 percent

Bk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 6 to 8 dry; 4 to 6 moist

*Chroma:* 4 to 6

*Texture:* sandy loam, fine sandy loam, loam  
gravelly loam

*Fragments:* 0 to 15 percent gravel

*Calcium carbonate equivalent:* 15 to 45 percent

**Begay Series****Setting**

*Local phase:* dry

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* alluvial flat on structural bench

*Parent material:* alluvium

*Elevation:* 5,100 to 6,300 feet (1,555 to 1,921 meters)

*Slope:* 1 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F.  
(7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, mesic Ustic  
Haplocambids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 12

minutes, 1.50 seconds north; longitude 111 degrees, 53 minutes, 4.05 seconds west; datum: NAD 83

- A1—0 to 2 inches; brown (7.5YR 4/4), loamy fine sand, light brown (7.5YR 6/4), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine and few medium roots; noneffervescent; neutral, pH 7.0; clear smooth boundary.
- A2—2 to 8 inches; brown (7.5YR 4/4), loamy fine sand, light brown (7.5YR 6/4), dry; 5 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine and few medium roots; noneffervescent; neutral, pH 7.2; clear smooth boundary.
- Bw—8 to 33 inches; brown (7.5YR 4/4), fine sandy loam, light brown (7.5YR 6/4), dry; 10 percent clay; weak coarse subangular blocky structure; very friable, soft, nonsticky, nonplastic; common very fine and few fine roots; noneffervescent; slightly alkaline, pH 7.4; gradual smooth boundary.
- Ck1—33 to 57 inches; brown (7.5YR 4/4), fine sandy loam, light brown (7.5YR 6/4), dry; 10 percent clay; massive; very friable, soft, nonsticky, nonplastic; few very fine, fine, and medium roots; slight effervescence; moderately alkaline, pH 8.0.
- Ck2—57 to 60 inches; strong brown (7.5YR 4/6), gravelly loam, strong brown (7.5YR 5/6), dry; 15 percent clay; massive; very friable, soft, nonsticky, nonplastic; 25 percent gravel; disseminated calcium carbonate throughout; strong effervescence; moderately alkaline, pH 8.2.

#### Range in Characteristics

*Depth to diagnostic feature:* 5 to 10 inches to cambic horizon

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18

Ck horizons:

*Chroma:* 4 to 6

*Texture:* fine sandy loam, loam, gravelly loam

*Calcium carbonate equivalent:* 1 to 5 percent

### Bigpack Series

#### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* alluvial flat

*Parent material:* shale alluvium

*Elevation:* 6,600 to 7,300 feet (2,012 to 2,225 meters)

*Slope:* 1 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

#### Taxonomic class

Fine-loamy, mixed, superactive, calcareous, frigid  
Aridic Ustorthents

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 36 minutes, 9.83 seconds north; longitude 111 degrees, 51 minutes, 34.26 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel and 5 percent cobbles

- A—0 to 2 inches; dark olive brown (2.5Y 3/3), clay loam, light olive brown (2.5Y 5/3), dry; 30 percent clay; weak medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine, many fine and few medium roots; 2 percent gravel; strong effervescence; moderately alkaline, pH 8.2.
- C1—2 to 12 inches; olive brown (2.5Y 4/3), loam, light olive brown (2.5Y 5/3), dry; 26 percent clay; moderate medium subangular blocky structure; common very fine and fine and few medium roots; 2 percent gravel; disseminated carbonates throughout; violent effervescence; moderately alkaline, pH 8.2.
- C2—12 to 28 inches; olive brown (2.5Y 4/3), loam, light yellowish brown (2.5Y 6/3), dry; 21 percent clay; massive; common very fine and fine and few medium roots; 2 percent gravel; disseminated carbonate throughout; violent effervescence; moderately alkaline, pH 8.2.
- C3—28 to 60 inches; light olive brown (2.5Y 5/3), loam, light yellowish brown (2.5Y 6/3), dry; 24 percent clay; massive; common very fine and fine and few medium roots; 12 percent gravel; disseminated carbonate throughout; violent effervescence; moderately alkaline, pH 8.4.

#### Range in Characteristics

*Surface fragments:* 0 to 10 percent gravel and 0 to 5 percent cobbles

*Particle-size control section (weighted average):*  
*Clay content:* 18 to 27 percent

## C horizons:

*Value:* 5 or 6 dry; 4 or 5 moist

**Billings Series****Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Landform:* flood plain, valley floor

*Parent material:* alluvium

*Elevation:* 4,400 to 4,900 feet (1,341 to 1,494 meters)

*Slope:* 0 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Fine-silty, mixed, active, calcareous, mesic Typic  
Torrifluvents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 8 minutes, 28.46 seconds north; longitude 111 degrees, 55 minutes, 1.95 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel and 1 percent cobbles

A—0 to 4 inches; olive brown (2.5Y 4/3), clay loam, light brownish gray (2.5Y 6/2), dry; 30 percent clay; moderate fine granular structure; very friable, slightly hard, moderately sticky, moderately plastic; common very fine and few fine and medium roots; 2 percent gravel and 2 percent cobbles; strong effervescence; moderately alkaline, pH 8.3; clear smooth boundary.

C1—4 to 27 inches; grayish brown (2.5Y 5/2), silty clay loam, light brownish gray (2.5Y 6/2), dry; 34 percent clay; weak medium subangular blocky structure; friable, hard, moderately sticky, moderately plastic; common very fine and few fine and medium roots; strong effervescence; strongly alkaline, pH 8.6; clear smooth boundary.

C2—27 to 31 inches; light olive brown (2.5Y 5/3), clay loam, light yellowish brown (2.5Y 6/3), dry; 31 percent clay; massive; friable, slightly hard, moderately sticky, moderately plastic; common very fine and few fine roots; 5 percent gravel and

10 percent parachanners; strong effervescence; strongly alkaline, pH 8.7; abrupt smooth boundary.

C3—31 to 43 inches; olive brown (2.5Y 4/3), silty clay loam, light yellowish brown (2.5Y 6/3), dry; 34 percent clay; massive; friable, hard, moderately sticky, moderately plastic; common very fine and few fine roots; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

Cy—43 to 64 inches; dark olive gray (5Y 4/2), silty clay loam, light brownish gray (5Y 6/2), dry; 36 percent clay; massive; friable, hard, moderately sticky, moderately plastic; common very fine roots; 1 percent gravel and 5 percent parachanners; 5 percent gypsum nodules throughout; strong effervescence; moderately alkaline, pH 7.9.

**Range in Characteristics**

*Surface fragments:* 0 to 10 percent gravel, 0 to 5 percent cobbles

*Flooding:* Rare in the months of July and August

*Particle-size control section (weighted average):*

*Clay content:* 27 to 35 percent

*Rock fragment content:* 7 percent, dominantly gravel, channers, and parachanners

## A horizon:

*Chroma:* 2 or 3

## C and Cy horizons:

*Chroma:* 2 or 3

*Value:* 4 or 5, moist

*Texture:* silty clay loam, clay loam

*Clay content:* 27 to 35 percent

*Fragments:* 0 to 10 percent gravel and 0 to 15 percent channers

*Gypsum content:* 0 to 8 percent

*Electrical conductivity:* 0 to 2 mmhos/cm

*Reaction:* pH 7.9 to 9.0

**Bispen Series****Setting**

*Depth class:* deep

*Drainage class:* excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* dunes on structural bench

*Parent material:* eolian sand and alluvium

*Elevation:* 5,600 to 6,700 feet (1,697 to 2,043 meters)

*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F.  
(7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

**Taxonomic class**

Siliceous, mesic Ustic Torripsamments

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 49 minutes, 18.72 seconds north; longitude 111 degrees, 27 minutes, 40.61 seconds west; datum: NAD 83

- A—0 to 4 inches; light yellowish brown (10YR 6/4), fine sand, very pale brown (10YR 7/4), dry; 1 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and few fine roots; noneffervescent; neutral, pH 7.2; clear smooth boundary.
- C—4 to 52 inches; brownish yellow (10YR 6/6), fine sand, yellow (10YR 7/6), dry; 1 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and few fine roots; noneffervescent; neutral, pH 7.2; abrupt smooth boundary.
- R—52 inches; Navajo Formation sandstone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)

*Particle-size control section (weighted average):*  
*Clay content:* 0 to 5 percent

A horizon:

*Hue:* 7.5YR or 10YR  
*Value:* 5 to 7 dry and 4 to 6 moist  
*Chroma:* 3 to 6

C horizons:

*Hue:* 5YR to 10YR  
*Value:* 5 to 7 dry; 4 to 6 moist  
*Chroma:* 3 to 6, dry or moist  
*Texture:* fine sand, sand

**Bodot Series**

**Setting**

*Depth class:* moderately deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)  
*Landform:* flats  
*Parent material:* shale residuum, slope alluvium  
*Elevation:* 6,260 to 7,060 feet (1,897 to 2,139 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F.  
(7.0 to 10.5 degrees C.)  
*Frost-free period:* 100 to 120 days

**Taxonomic class**

Fine, smectitic, calcareous, mesic Torretic Ustorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 35 minutes, 26.58 seconds north; longitude 112 degrees, 4 minutes, 47.96 seconds west; datum: NAD 83

- A—0 to 2 inches; light olive brown (2.5Y 5/3), silty clay, light yellowish brown (2.5Y 6/3), dry; 45 percent clay; weak very fine granular structure; very firm, hard, very sticky, very plastic; common fine and medium roots; violent effervescence; moderately alkaline, pH 8.3; abrupt smooth boundary.
- Bss—2 to 33 inches; light olive brown (2.5Y 5/3), silty clay, light gray (2.5Y 7/2), dry; 45 percent clay; strong coarse angular blocky structure; very firm, hard, very sticky, very plastic; few fine and medium roots; violent effervescence; moderately alkaline, pH 8.3; gradual wavy boundary.
- Cr—33 inches; Tropic Shale bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Particle-size control section (weighted average):*  
*Clay content:* 40 to 50 percent

A and AB horizons (when present):

*Chroma:* 1 to 3

Bss horizon:

*Chroma:* 1 to 3  
*Clay content:* 40 to 60 percent  
*Electrical conductivity:* 0 to 2 mmhos/cm

**Bowdish Series**

**Setting**

*Depth class:* moderately deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* dipslope on structural bench

*Parent material:* residuum

*Elevation:* 5,000 to 5,790 feet (1,524 to 1,765 meters)

*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Ustic  
Haplocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 6 minutes, 11.90 seconds north; longitude 112 degrees, 2 minutes, 9.40 seconds west; datum: NAD 83

*Surface fragments:* 50 percent gravel and 15 percent cobbles

A—0 to 4 inches; brown (7.5YR 4/3), very gravelly loam, light brown (7.5YR 6/4), dry; 17 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; many very fine, common fine and few medium and coarse roots; common very fine tubular and many very fine interstitial pores; 30 percent gravel and 7 percent cobbles; slight effervescence; slightly alkaline, pH 7.7; clear wavy boundary.

Bw—4 to 7 inches; reddish brown (5YR 4/4), loam, reddish brown (5YR 5/4), dry; 20 percent clay; weak fine and medium subangular blocky structure; friable, soft, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and fine tubular and common very fine interstitial pores; 10 percent gravel and 2 percent cobbles; slight effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

Bk1—7 to 15 inches; yellowish red (5YR 4/6), silt loam, yellowish red (5YR 5/6), dry; 23 percent clay; weak medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine, fine tubular and common very fine interstitial pores; 5 percent gravel and 10 percent cobbles; violent effervescence; moderately alkaline, pH 8.3; clear wavy boundary.

Bk2—15 to 21 inches; strong brown (7.5YR 5/6), cobbly silt loam, reddish yellow (7.5YR 6/6), dry; 23 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and fine tubular pores; 15 percent gravel and 15 percent cobbles; violent effervescence; strongly alkaline, pH 8.5; abrupt smooth boundary.

R—21 inches; limestone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Depth to secondary carbonates:* 5 to 20 inches

*Surface fragments:* 45 to 55 percent gravel and 10 to 20 percent cobbles

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 0 to 30 percent, predominately gravel

A horizon:

*Chroma:* 3 or 4

Bw and Bk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 4 to 6 dry, 4 or 5 moist

*Chroma:* 4 to 6

*Texture:* silt loam, cobbly silt loam, loam

*Fragments:* 0 to 20 percent gravel and 0 to 20 percent cobbles

*Calcium carbonate equivalent:* 5 to 10 percent in Bw, 15 to 30 percent in Bk

**Bowington Series**

**Setting**

*Depth class:* very deep

*Drainage class:* moderately well

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* stream terraces

*Parent material:* alluvium

*Elevation:* 4,800 to 5,800 feet (1,463 to 1,768 meters)

*Slope:* 0 to 5 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Sandy, mixed, mesic Oxyaquic Torrifuvents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 46 minutes, 25.06 seconds north; longitude 111 degrees, 25 minutes, 40.77 seconds west; datum: NAD 83

A—0 to 2 inches; brown (10YR 5/3), fine sand, pale brown (10YR 6/3), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine and few medium roots; many very fine and fine tubular pores; slight effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

C1—2 to 37 inches; pale brown (10YR 6/3), fine sand, very pale brown (10YR 7/3), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine, fine, medium, and coarse roots; many very fine and fine interstitial and few fine and medium tubular pores; strong effervescence; moderately alkaline, pH 8.2; gradual wavy boundary.

C2—37 to 49 inches; brown (10YR 5/3), fine sand, light gray (10YR 7/2), dry; 2 percent clay; massive; loose, loose, nonsticky, nonplastic; few fine, medium, and coarse roots; many very fine and fine interstitial and few fine and medium tubular pores; 2 percent fine prominent irregular black (10YR 2/1), moist, manganese masses with sharp boundaries in the matrix, 3 percent medium prominent irregular strong brown (7.5YR 5/8), moist, masses of oxidized iron with sharp boundaries on surfaces along root channels, 7 percent medium prominent irregular strong brown (7.5YR 5/8), moist, masses of oxidized iron with sharp boundaries in the matrix; strong effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

C3—49 to 60 inches; light gray (2.5Y 7/2), loamy fine sand, 50 percent bluish black (5PB 2.5/1) and 50 percent gray (N 5/0) reduced, dry; 10 percent clay; massive; very friable, soft, slightly sticky, slightly plastic; few very fine, medium, coarse and many fine roots; common very fine and fine and few medium tubular pores; 15 percent prominent clay films on surfaces along root channels, 50 percent prominent black (10YR 2/1), moist, organic stains in the matrix; 2 percent fine prominent irregular black (10YR 2/1), moist, manganese masses with sharp boundaries in the matrix; strong

effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

C4—60 to 62 inches; 50 percent bluish black (5PB 2.5/1) and 50 percent gray (N 5/0) reduced, loamy fine sand, light gray (2.5Y 7/1), dry; 10 percent clay; massive; very friable, soft, slightly sticky, slightly plastic; few fine, medium, and coarse roots; few very fine, fine, and medium tubular pores; 7 percent prominent clay films on surfaces along root channels, 25 percent prominent black (10YR 2/1), moist, organic stains in the matrix; 2 percent fine prominent irregular black (10YR 2/1), moist, manganese masses with sharp boundaries in the matrix; 10 percent gravel; strong effervescence; moderately alkaline, pH 8.4.

**Range in Characteristics**

*Depth to lithologic discontinuity:* 20 to 30 inches

*Depth to redox concentration:* 28 to 60 inches

*Depth to redox depletions:* 28 to 60 inches

*Depth to endosaturation:* 40 to 60 inches from July to September

*Particle-size control section (weighted average):*

*Clay content:* 0 to 15 percent

*Rock fragment content:* 0 to 15 percent rounded gravel, cobbles, and stones

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry, 4 to 6 moist

*Chroma:* 3 to 5, dry or moist

C horizons:

*Hue:* 7.5YR to 2.5Y

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 5, dry or moist

*Texture:* sand, loamy sand, fine sand

*Clay content:* 0 to 15 percent

*Fragments:* 5 to 15 percent gravel

*Note:* C3 and C4 horizons have gley colors common for a reduced matrix caused by the depletion of iron

**Brumley Series****Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* fan remnants

*Parent material:* slope alluvium

*Elevation:* 6,200 to 7,200 feet (1,879 to 2,195 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Calcic Haplustalfs

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 27 minutes, 29.00 seconds north; longitude 111 degrees, 30 minutes, 29.00 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel

A—0 to 7 inches; brown (7.5YR 4/3), fine sandy loam, brown (7.5YR 5/4), dry; 11 percent clay; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine roots; many very fine irregular pores; noneffervescent; slightly alkaline, pH 7.8; clear smooth boundary.

Bt—7 to 17 inches; brown (7.5YR 4/4), clay loam, reddish yellow (7.5YR 6/6), dry; 28 percent clay; moderate fine subangular blocky structure; friable, slightly hard, slightly sticky, nonplastic; few very fine and fine roots; common very fine and few fine tubular irregular pores; common distinct clay films on faces of peds; noneffervescent; slightly alkaline, pH 7.8; clear smooth boundary.

Btk—17 to 27 inches; reddish brown (5YR 4/4), clay loam, reddish brown (5YR 5/4), dry; 30 percent clay; moderate medium subangular blocky structure; firm, slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; common very fine irregular and few fine tubular pores; common distinct clay films on faces of peds; discontinuous distinct carbonate coats on all faces of peds; slight effervescence; moderately alkaline, pH 8.3; clear wavy boundary.

Bk1—27 to 44 inches; light brown (7.5YR 6/3), loam, pinkish gray (7.5YR 7/2), dry; 24 percent clay; moderate fine and medium subangular blocky structure; firm, slightly hard, slightly sticky, slightly plastic; common very fine interstitial and few very fine tubular pores; patchy distinct carbonate coats on bottom surfaces of rock fragments; 5 percent gravel and 1 percent cobbles; violent

effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

Bk2—44 to 60 inches; brown (7.5YR 5/4), sandy clay loam, pink (7.5YR 7/3), dry; 20 percent clay; weak fine and medium subangular blocky structure; firm, slightly hard, nonsticky, nonplastic; few very fine tubular pores; patchy distinct carbonate coats on bottom surfaces of rock fragments; 5 percent gravel and 2 percent cobbles; strong effervescence; strongly alkaline, pH 8.5; abrupt smooth boundary.

**Range in Characteristics**

*Depth to secondary carbonates:* 14 to 27 inches

*Depth to diagnostic feature:* 2 to 10 inches to argillic horizon

*Surface fragments:* 0 to 5 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 27 to 35 percent

*Rock fragment content:* 0 to 15 percent, dominantly gravel and cobbles

A horizon:

*Chroma:* 3 or 4

Bt horizon:

*Chroma:* 4 to 6

*Clay content:* 27 to 35 percent

*Fragments:* 0 to 10 percent gravel

Btk and Bk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 2 to 5

*Texture:* clay loam, loam, sandy clay loam

*Clay content:* 18 to 35 percent

*Fragments:* 0 to 10 percent gravel

*Calcium carbonate equivalent:* 5 to 30 percent

**Calcree Series**

**Setting**

*Depth class:* moderately deep

*Drainage class:* poorly drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Landform:* stream terraces, drainageways

*Parent material:* alluvium

*Elevation:* 4,800 to 5,800 feet (1,454 to 1,768 meters)

*Slope:* 0 to 4 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F.  
(7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

#### **Taxonomic class**

Sandy, mixed, mesic Aeric Endoaquents

#### **Typical Pedon**

*Location in survey area:* latitude 37 degrees, 50 minutes, 49.54 seconds north; longitude 111 degrees, 21 minutes, 13.39 seconds west; datum: NAD 83

A—0 to 8 inches; brown (7.5YR 5/4), fine sand, light brown (7.5YR 6/4), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine, fine, and many medium and coarse roots; 7 percent fine distinct yellowish red (5YR 5/8), moist, iron-manganese masses on surfaces along pores and root channels; 30 percent black (10YR 2/1) organic staining on faces of peds; noneffervescent; neutral, pH 7.2; clear wavy boundary.

C1—8 to 15 inches; brown (7.5YR 5/4), fine sand, light brown (7.5YR 6/4), dry; 2 percent clay; massive; loose, loose, nonsticky, nonplastic; many very fine and fine and common medium and coarse roots; 3 percent fine distinct yellowish red (5YR 5/8), moist, iron-manganese masses on surfaces along root channels and pores; 10 percent black (10YR 2/1) organic staining on faces of peds; 2 percent gravel; noneffervescent; neutral, pH 7.2; clear wavy boundary.

C2—15 to 27 inches; light brown (7.5YR 6/4), fine sand, pink (7.5YR 7/4), dry; 2 percent clay; massive; loose, loose, nonsticky, nonplastic; common very fine and fine roots; 15 percent fine distinct black (10YR 2/1), moist, manganese coatings on faces of peds; 10 percent black (10YR 2/1), organic staining on faces of peds; noneffervescent; neutral, pH 7.2; abrupt wavy boundary.

R—27 inches; Navajo Formation sandstone bedrock.

#### **Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Depth to redox concentrations:* 0 to 8 inches

*Endosaturation:* at a depth between 0 and 8 inches

*Ponding:* Rare in the months of July, August and September

*Flooding:* Occasional in the months of July, August and September

*Particle-size control section (weighted average):*

*Clay content:* 0 to 8 percent  
*Rock fragment content:* 0 to 15 percent, dominantly gravel

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry, 4 or 5 moist

*Chroma:* 3 to 6 dry, or moist

*Notes:* The A horizon is sometimes capped by a 1-2 inch layer of organic material or muck (Oi or Oe horizon)

C horizons:

*Hue:* 7.5YR or 10YR

*Value:* 6 or 7 dry, 5 or 6 moist

*Chroma:* 3 to 6 dry, or moist

*Texture:* fine sand or sand

*Fragments:* 0 to 15 percent gravel

## **Cannonville Series**

### **Setting**

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Landform:* hillslope

*Parent material:* shale residuum

*Elevation:* 4,800 to 6,600 feet (1,455 to 2,000 meters)

*Slope:* 15 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F.  
(7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### **Taxonomic class**

Clayey, smectitic, calcareous, mesic, shallow Ustic Torriorthents

### **Typical Pedon**

*Location in survey area:* latitude 37 degrees, 37 minutes, 29.00 seconds north; longitude 112 degrees, 3 minutes, 38.00 seconds west; datum: NAD 83

A—0 to 7 inches; olive gray (5Y 5/2), clay, light olive gray (5Y 6/2), dry; 40 percent clay; weak very fine platy structure; firm, soft, slightly sticky, slightly plastic; few fine, medium, and coarse roots; common fine and medium pores; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.4; abrupt boundary.

Cr—7 inches; Tropic Shale soft bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Particle-size control section (weighted average):*

*Clay content:* 40 to 50 percent

*Rock fragment content:* 5 percent, dominantly gravel

A horizons:

*Value:* 6 or 7 dry; 4 or 5 moist

*Chroma:* 2 to 4

*Fragments:* 0 to 5 percent gravel

C horizons:

*Hue:* 5Y or 2.5Y

*Value:* 6 or 7 dry; 5 or 6 moist

*Chroma:* 2 or 3

*Texture:* clay loam, clay

*Clay content:* 40 to 50 percent

*Fragments:* 0 to 10 percent gravel

*Electrical conductivity:* 0 to 8 mmhos/cm

### Casmos Family

#### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* structural bench

*Parent material:* slope alluvium, colluvium, residuum

*Elevation:* 4,370 to 5,000 feet (1,324 to 1,524 meters)

*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

#### Taxonomic class

Loamy, mixed, superactive, calcareous, mesic Lithic Torriorthents

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 14 minutes, 11.62 seconds north; longitude 111 degrees, 55 minutes, 8.25 seconds west; datum: NAD 83

*Surface fragments:* 30 percent gravel, 10 percent cobbles, 10 percent channers and 20 percent flagstones

A—0 to 3 inches; brown (10YR 4/3), gravelly loam, pale brown (10YR 6/3), dry; 21 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine irregular and tubular pores; 15 percent gravel, 5 percent cobbles, 5 percent channers, and 5 percent flagstones; slight effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

C1—3 to 10 inches; dark yellowish brown (10YR 4/4), gravelly loam, pale brown (10YR 6/3), dry; 22 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine tubular pores; 15 percent angular gravel and 2 percent channers; slight effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

C2—10 to 13 inches; dark grayish brown (10YR 4/2), channery loam, brown (10YR 5/3), dry; 24 percent clay; massive; friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine roots; common very fine tubular pores; 10 percent angular gravel and 20 percent channers; slight effervescence; moderately alkaline, pH 8.3; abrupt smooth boundary.

R—13 inches; Dakota Formation bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 15 to 35 percent angular gravel, 0 to 15 percent cobbles, 0 to 15 percent channers, and 5 to 25 percent flagstones

*Particle-size control section (weighted average):*

*Clay content:* 20 to 25 percent

*Rock fragment content:* 15 to 30 percent, dominantly gravel, cobbles, channers, and flagstones

C horizons:

*Texture:* gravelly loam, channery loam

*Clay content:* 20 to 25 percent

*Fragments:* 5 to 20 percent angular gravel and 0 to 35 percent channers

*Calcium carbonate equivalent:* 1 to 15 percent

### Catahoula Series

#### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* Landslide deposits on escarpments

*Parent material:* colluvium, slope alluvium  
*Elevation:* 5,200 to 6,500 feet (1,585 to 1,982 meters)  
*Slope:* 15 to 60 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 15 minutes, 7.00 seconds north; longitude 111 degrees, 1 minute 38.00 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel, 10 percent cobbles, 10 percent stones, and 15 percent boulders

A—0 to 5 inches; brown (10YR 4/3), very bouldery sandy loam, pale brown (10YR 6/3), dry; 17 percent clay; weak fine and medium subangular blocky parting to fine granular structure; friable, soft, nonsticky, nonplastic; few very fine and fine roots; common very fine interstitial and few fine tubular pores; 15 percent gravel, 10 percent cobbles, 10 percent stones, and 10 percent boulders; slight effervescence; carbonates disseminated throughout; moderately alkaline, pH 8.0; clear smooth boundary.

C1—5 to 26 inches; brown (10YR 5/3), very bouldery loam, pale brown (10YR 6/3), dry; 26 percent clay; massive; firm, slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; few fine tubular and common very fine interstitial pores; 10 percent gravel, 10 percent cobbles, 5 percent stones, and 15 percent boulders; slight effervescence; carbonates disseminated throughout; moderately alkaline, pH 8.0; clear wavy boundary.

C2—26 to 49 inches; grayish brown (10YR 5/2), very bouldery loam, light gray (10YR 7/2), dry; 27 percent clay; massive; firm, slightly hard, slightly sticky, slightly plastic; few very fine roots; common very fine interstitial pores; 5 percent gravel, 5 percent cobbles, 10 percent stones, and 20 percent boulders; strong effervescence; carbonates disseminated throughout; moderately alkaline, pH 8.2; gradual wavy boundary.

C3—49 to 60 inches; dark yellowish brown (10YR 4/4),

very bouldery loam, light yellowish brown (2.5Y 6/4), dry; 27 percent clay; massive; firm, slightly hard, slightly sticky, slightly plastic; few very fine roots; many very fine interstitial pores; 5 percent gravel, 10 percent cobbles, 5 percent stones, and 25 percent boulders; strong effervescence; carbonates disseminated throughout; moderately alkaline, pH 8.2.

**Range in Characteristics**

*Surface fragments:* 0 to 15 percent gravel, 5 to 20 percent cobbles, 5 to 25 percent stones, and 5 to 25 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 75 percent, dominantly stones and boulders

A horizon:

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 2 to 4

*Fragments:* 5 to 15 percent gravel fragment

C horizons:

*Hue:* 10YR or 2.5Y

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 2 to 4

*Texture:* very bouldery loam, very stony loam

*Clay content:* 18 to 27 percent

*Fragments:* 5 to 20 percent gravel, 5 to 20 percent cobbles, 5 to 20 percent stones and 0 to 25 percent boulders

**Chilton Family**

**Setting**

*Depth class:* shallow to moderately deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* ledge on escarpment

*Parent material:* colluvium, residuum, slope alluvium

*Elevation:* 5,400 to 6,800 feet (1,646 to 2,073 meters)

*Slope:* 50 to 80 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 29 minutes, 53.75 seconds north; longitude 111 degrees, 28 minutes, 21.72 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 10 percent cobbles, 10 percent stones, and 25 percent boulders

A1—0 to 1 inch; brown (7.5YR 5/4), very bouldery sandy loam, brown (7.5YR 5/3), dry; 10 percent clay; moderate thick platy structure; 10 percent gravel, 10 percent cobbles, 10 percent stones, and 25 percent boulders; slight effervescence; moderately alkaline, pH 8.2.

A2—1 to 4 inches; brown (7.5YR 5/4), stony sandy loam, brown (7.5YR 5/3), dry; 10 percent clay; strong very fine granular structure; 15 percent gravel and 15 percent stones; slight effervescence; moderately alkaline, pH 8.2.

C—4 to 39 inches; brown (7.5YR 4/4), very stony sandy loam, light brown (7.5YR 6/4), dry; 15 percent clay; massive; 25 percent gravel and 15 percent stones; slight effervescence; moderately alkaline, pH 8.2.

R—39 inches; bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Surface fragments:* 0 to 10 percent gravel, 0 to 10 percent cobbles, 0 to 10 percent stones, and 10 to 25 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

*Rock fragment content:* 40 percent, dominantly gravel, cobbles, and stones

A horizons:

*Chroma:* 3 or 4

*Fragments:* 5 to 15 percent gravel, 0 to 10 percent cobbles, 5 to 15 percent stones, and 0 to 25 percent boulders

C horizon:

*Clay content:* 8 to 18 percent

*Fragments:* 20 to 30 percent gravel and 10 to 20 percent stones

**Chinchin Series****Setting**

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* hillslopes and escarpments on structural benches

*Parent material:* residuum, colluvium

*Elevation:* 5,100 to 6,900 feet (1,555 to 2,104 meters)

*Slope:* 25 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy, mixed, superactive, mesic Lithic Calcicargids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 48 minutes, 7.60 seconds north; longitude 111 degrees, 11 minutes, 59.10 seconds west; datum: NAD 83

*Surface fragments:* 70 percent gravel, 5 percent cobbles, and 5 percent stones

A—0 to 4 inches; reddish brown (2.5YR 4/4), gravelly loam, reddish brown (2.5YR 5/4), dry; 24 percent clay; weak fine and medium platy parting to moderate fine granular structure; very friable, slightly hard, slightly sticky, slightly plastic; few very fine interstitial pores; 14 percent gravel, 4 percent cobbles, and 4 percent stones; moderate effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Btk—4 to 10 inches; dark reddish brown (2.5YR 3/4), clay loam, reddish brown (2.5YR 4/4), dry; 34 percent clay; strong fine subangular blocky structure; friable, hard, moderately sticky, moderately plastic; few very fine and fine roots; common fine soft carbonate masses and distinct thin clay films on vertical faces of peds; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

R—10 inches; Chinle Formation shale bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Depth to secondary carbonates and argillic horizon:* 3 to 10 inches

*Surface fragments:* 35 to 75 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent stones

*Particle-size control section (weighted average):**Clay content: 27 to 35 percent**Rock fragment content: 5 to 15 percent, dominantly gravel*

## A horizon:

*Hue: 2.5YR or 5YR**Value: 4 or 5 dry; 3 or 4 moist**Chroma: 4 to 6*

## Btk horizon:

*Hue: 2.5YR or 5YR**Value: 4 or 5 dry; 3 or 4 moist**Chroma: 4 to 6**Texture: clay loam, loam**Clay content: 27 to 35 percent**Fragments: 0 to 30 percent gravel**Calcium carbonate equivalent: 15 to 30 percent***Chipeta Series****Setting***Depth class: very shallow to shallow**Drainage class: well drained**Slowest permeability: 0.06 to 0.2 in/hr (slow)**Landform: hillslope**Parent material: residuum, colluvium**Elevation: 3,800 to 4,800 feet (1,159 to 1,463 meters)**Slope: 2 to 30 percent**Climatic data:**Mean annual precipitation: 6 to 9 inches (152 to 229 millimeters)**Mean annual air temperature: 52 to 57 degrees F. (11.0 to 14.0 degrees C.)**Frost-free period: 160 to 190 days***Taxonomic class**Clayey, mixed, active, calcareous, mesic, shallow  
Typic Torriorthents**Typical Pedon***Location in survey area: latitude 37 degrees, 10 minutes, 15.00 seconds north; longitude 111 degrees, 56 minutes, 3.00 seconds west; datum: NAD 83*

A—0 to 3 inches; grayish brown (2.5Y 5/2), silty clay loam, light grayish brown (2.5Y 6/2), dry; weak medium subangular blocky parting to weak fine granular structure; friable, soft, slightly sticky, slightly plastic; few fine roots; moderately alkaline, pH 8.0; clear wavy boundary.

C—3 to 11 inches; grayish brown (2.5Y 5/2), silty clay

loam, light brownish gray (2.5Y 6/2), dry; moderate fine and medium subangular blocky structure; firm, very hard, slightly sticky, slightly plastic; common very fine and fine roots; fine distinct gypsum veins; moderately alkaline, pH 8.2; clear wavy boundary.

Cr—11 inches; Tropic Shale bedrock.

**Range in Characteristics***Depth to restrictive feature: 4 to 20 inches to bedrock (paralithic)**Particle-size control section (weighted average):**Clay content: 35 to 40 percent*

## C horizon:

*Gypsum content: 1 to 10 percent**Electrical conductivity: 0 to 8 mmhos/cm**Sodium adsorption ratio: 0 to 5***Clapper Series****Setting***Local phase: dry**Depth class: very deep**Drainage class: well drained**Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)**Landform: hillslope on landslides, fan remnants**Parent material: mixed alluvium**Elevation: 5,070 to 6,500 feet (1,536 to 1,982 meters)**Slope: 2 to 60 percent**Climatic data:**Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)**Mean annual air temperature: 45 to 52 degrees F. (7.0 to 11.0 degrees C.)**Frost-free period: 120 to 160 days***Taxonomic class**Loamy-skeletal, mixed, superactive, mesic Ustic  
Haplocalcids**Typical Pedon***Location in survey area: latitude 37 degrees, 16 minutes, 34.00 seconds north; longitude 111 degrees, 4 minutes, 7.00 seconds west; datum: NAD 83**Surface fragments: 5 percent gravel, 5 percent cobbles, 10 percent stones, and 2 percent boulders*

A—0 to 5 inches; dark yellowish brown (10YR 4/4), very stony sandy loam, yellowish brown (10YR

5/4), dry; 15 percent clay; weak fine and medium subangular blocky structure; very friable, soft, nonsticky, nonplastic; few very fine, fine, and medium roots; few very fine tubular pores; 10 percent gravel, 15 percent cobbles, and 15 percent stones; very slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

Bw—5 to 13 inches; dark yellowish brown (10YR 4/4), very stony loam, light yellowish brown (10YR 6/4), dry; 19 percent clay; weak medium subangular blocky structure; friable, soft, slightly sticky, slightly plastic; few very fine, fine, and medium roots; few very fine and fine tubular pores; 10 percent gravel, 15 percent cobbles, and 15 percent stones; very slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

Bk1—13 to 20 inches; brown (10YR 4/3), very cobbly loam, pale brown (10YR 6/3), dry; 20 percent clay; weak medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; patchy distinct carbonate coats on bottom surfaces of rock fragments; 15 percent gravel, 30 percent cobbles, 5 percent stones, and 5 percent boulders; strong effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

Bk2—20 to 38 inches; brown (10YR 5/3), very cobbly loam, very pale brown (10YR 7/3), dry; 22 percent clay; weak fine and medium subangular blocky structure; firm, slightly hard, slightly sticky, nonplastic; few very fine and fine roots; few very fine and fine tubular pores; patchy distinct carbonate coats on bottom surfaces of rock fragments; 10 percent gravel, 30 percent cobbles, 5 percent stones, and 2 percent boulders; strong effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

Bk3—38 to 60 inches; yellowish brown (10YR 5/4), very cobbly loam, very pale brown (10YR 7/4), dry; 23 percent clay; weak fine and medium subangular blocky structure; firm, slightly hard, slightly sticky, slightly plastic; few very fine roots; few very fine tubular pores; continuous distinct carbonate coats on bottom surfaces of rock fragments; 10 percent gravel, 30 percent cobbles, 5 percent stones, and 2 percent boulders; strong effervescence; moderately alkaline, pH 8.4.

#### Range in Characteristics

*Depth to secondary carbonates:* 6 to 19 inches  
*Surface fragments:* 0 to 45 percent gravel, 0 to 20

percent cobbles, 5 to 15 percent stones, and 0 to 5 percent boulders

#### *Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 70 percent gravel, cobbles, and stones

#### A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 5 or 6 dry; 3 to 5 moist

*Chroma:* 2 to 6, dry or moist

*Fragments:* 0 to 20 percent gravel, 0 to 15 percent cobbles, and 0 to 15 percent stones

#### Bw horizon:

*Hue:* 7.5YR or 10YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 2 to 5, dry or moist

*Texture:* gravelly loam, very stony loam

*Fragments:* 5 to 30 percent rounded gravel, 10 to 20 percent rounded cobbles, and 10 to 20 percent rounded stones

#### Bk horizons:

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry; 4 to 7 moist

*Chroma:* 2 to 5, dry or moist

*Texture:* very gravelly loam, very cobbly loam, extremely gravelly loam

*Fragments:* 5 to 65 percent rounded gravel, 10 to 35 percent rounded cobbles, 0 to 10 percent rounded stones, and 0 to 10 percent rounded boulders

*Calcium carbonate equivalent:* 15 to 30 percent

## Colskel Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* hillslopes on structural benches and structural benches

*Parent material:* colluvium, residuum

*Elevation:* 5,600 to 7,800 feet (1,707 to 2,378 meters)

*Slope:* 2 to 50 percent

#### *Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic  
Aridic Lithic Ustorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 40 minutes, 8.00 seconds north; longitude 111 degrees, 43 minutes, 8.00 seconds west; datum: NAD 83

*Surface fragments:* 20 percent gravel, 10 percent cobbles, 10 percent flagstones, and 10 percent stones

A—0 to 7 inches; brown (10YR 5/3), very gravelly loam, pale brown (10YR 6/3), dry; 21 percent clay; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine and fine tubular pores; 25 percent gravel, 10 percent cobbles, and 10 percent flagstones; strong effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

C—7 to 18 inches; yellowish brown (10YR 5/4), extremely gravelly loam, light yellowish brown (10YR 6/4), dry; 25 percent clay; weak fine and medium subangular blocky structure; common very fine, fine, and medium roots; few very fine, fine, and medium pores; 35 percent gravel, 10 percent cobbles, 10 percent flagstones, and 10 percent stones; strong effervescence; moderately alkaline, pH 8.4, abrupt smooth boundary.

R—18 inches; Straight Cliff Formation sandstone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 5 to 30 percent gravel, 5 to 20 percent cobbles, 5 to 40 percent channers, and 5 to 20 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 75 percent, gravel, cobbles, channers, and flagstones

A horizons:

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry; 3 to 6 moist

*Chroma:* 3 or 4

*Fragments:* 10 to 25 percent gravel, 0 to 10

percent cobbles, 0 to 10 percent flagstones, and 0 to 15 percent stones

C horizons:

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 5

*Texture:* gravelly loam, very gravelly loam, extremely channery loam, extremely gravelly loam

*Clay content:* 18 to 27 percent

*Fragments:* 20 to 50 percent gravel, 10 to 15 percent cobbles, and 0 to 20 percent stones

**Crotoncanyon Series**

**Setting**

*Depth class:* shallow

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* hillslopes on structural benches

*Parent material:* colluvium, residuum

*Elevation:* 4,000 to 5,200 feet (1,220 to 1,585 meters)

*Slope:* 15 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, mesic Lithic  
Haplocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 9 minutes, 57.40 seconds north; longitude 111 degrees, 40 minutes, 1.80 seconds west; datum: NAD 83

*Surface fragments:* 30 percent angular gravel

A—0 to 2 inches; yellowish brown (10YR 5/4), gravelly clay loam, light yellowish brown (10YR 6/4), dry; 32 percent clay; moderate medium platy parting to moderate fine granular structure; firm, moderately hard, moderately sticky, moderately plastic; common very fine and fine roots; common very fine interstitial pores; 25 percent gravel; slight effervescence; carbonates are disseminated

throughout; moderately alkaline, pH 8.0; clear smooth boundary.

Bk—2 to 11 inches; yellowish brown (10YR 5/4), very gravelly clay loam, light yellowish brown (10YR 6/4), dry; 34 percent clay; moderate medium subangular blocky structure; firm, moderately hard, moderately sticky, moderately plastic; common very fine and fine roots; common very fine interstitial pores; carbonates are disseminated throughout; 50 percent gravel; strong effervescence; strongly alkaline, pH 8.6; abrupt smooth boundary.

R—11 inches; Straight Cliffs Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Depth to secondary carbonates:* 1 to 14 inches

*Surface fragments:* 20 to 40 percent angular gravel

*Particle-size control section (weighted average):*

*Clay content:* 27 to 40 percent

*Rock fragment content:* 35 to 75 percent, dominantly, gravel, cobbles, and, occasionally, channers.

A horizon:

*Hue:* 7.5YR to 2.5Y

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 2 to 4, dry or moist

Bk horizon:

*Hue:* 7.5YR to 2.5Y

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 2 to 4, dry or moist

*Texture:* very gravelly clay loam, extremely gravelly clay loam, very cobbly loam, extremely cobbly loam

*Fragments:* 35 to 75 percent gravel

*Calcium carbonate equivalent:* 15 to 30 percent

### Curecanti Family

#### Setting

*Local phase:* cool

*Depth class:* moderately deep to very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* remnant stream terrace, mountain slope on structural bench

*Parent material:* colluvium, alluvium

*Elevation:* 6,800 to 8,200 feet (2,073 to 2,485 meters)

*Slope:* 2 to 70 percent

*Climatic data:*

*Mean annual precipitation:* 16 to 20 inches (406 to 508 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

#### Taxonomic class

Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 14 minutes, 32.99 seconds north; longitude 111 degrees, 4 minutes, 0.52 seconds west; datum: NAD 83

*Surface fragments:* 5 percent cobbles and 5 percent stones

A—0 to 6 inches; very dark grayish brown (10YR 3/2), loam, dark brown (10YR 3/3), dry; 23 percent clay; weak medium subangular blocky parting to weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine and fine roots; few very fine and fine tubular pores; 5 percent gravel; noneffervescent; slightly alkaline, pH 7.4; clear smooth boundary.

Bw—6 to 11 inches; very dark grayish brown (10YR 3/2), loam, dark brown (10YR 3/3), dry; 24 percent clay; weak fine and medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; 10 percent gravel; noneffervescent; slightly alkaline, pH 7.4; clear smooth boundary.

Bt1—11 to 20 inches; dark brown (10YR 3/3), very gravelly clay loam, brown (10YR 4/3), dry; 28 percent clay; moderate medium subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; many very fine and fine roots; common very fine, fine, and medium tubular pores; common distinct clay films on all faces of pedis; 25 percent gravel, 5 percent cobbles, and 5 percent stones; noneffervescent; slightly alkaline, pH 7.4; clear smooth boundary.

Bt2—20 to 32 inches; dark brown (10YR 3/3), very gravelly clay loam, brown (10YR 4/3), dry; 28 percent clay; moderate medium subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; common very fine and fine roots; common very fine, fine, and medium tubular

pores; common distinct clay films on all faces of peds; 35 percent gravel, 5 percent cobbles, and 5 percent stones; noneffervescent; slightly alkaline, pH 7.6; abrupt smooth boundary.

R—32 inches; Straight Cliffs Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 20 to greater than 60 inches to bedrock (lithic)

*Depth to diagnostic feature:* 5 to 20 inches to argillic horizon

*Surface fragments:* 10 to 15 gravel, 10 to 15 percent cobbles, 10 to 15 percent stones, and 0 to 15 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 35 to 50 percent gravel, cobbles, and stones

A horizon:

*Chroma:* 2 or 3, dry and moist

*Fragments:* 10 to 15 percent gravel

Bt horizons:

*Hue:* 7.5YR to 2.5Y

*Chroma:* 3 or 4, dry or moist

*Clay content:* 18 to 35 percent

*Fragments:* 10 to 15 percent gravel, 10 to 15 percent cobbles, and 15 to 20 percent stones

### Daklos Series

#### Setting

*Local phases:* steep, saline

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* structural benches, hillslopes on structural benches, ledges on escarpments

*Parent material:* residuum, slope alluvium

*Elevation:* 4,800 to 6,900 feet (1,463 to 2,104 meters)

*Slope:* 2 to 70 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### Taxonomic class

Loamy-skeletal, mixed, superactive, calcareous, mesic  
Lithic Ustic Torriorthents

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 35 minutes, 26.62 seconds north; longitude 111 degrees, 27 minutes, 29.74 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel

A—0 to 3 inches; brown (10YR 5/3), loam, very pale brown (10YR 7/3), dry; 20 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine and fine roots; 5 percent gravel; slight effervescence; carbonates are disseminated throughout; slightly alkaline, pH 7.6; abrupt smooth boundary.

C—3 to 10 inches; brown (10YR 5/3), very gravelly loam, very pale brown (10YR 7/3), dry; 20 percent clay; massive; friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium roots; 55 percent gravel; slight effervescence; carbonates are disseminated throughout; slightly alkaline, pH 7.6; abrupt smooth boundary.

R—10 inches; Dakota Formation Sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 55 percent gravel, 0 to 15 percent cobbles, 0 to 15 percent channers, 0 to 15 percent flagstones, 0 to 20 percent stones, and 0 to 20 percent boulders,

*Particle-size control section (weighted average):*

*Clay content:* 12 to 27 percent

*Rock fragment content:* 35 to 60 percent gravel, cobbles, channers, and stones

A horizons:

*Value:* 6 or 7 dry; 4 or 5 moist

*Chroma:* 3 or 4

*Reaction:* slightly to moderately alkaline

*Fragments:* 5 to 25 percent gravel, 0 to 20 percent cobbles, and 0 to 20 percent stones

C horizons:

*Value:* 6 or 7 dry; 4 or 5 moist

*Chroma:* 3 or 4

*Texture:* extremely gravelly loam, very gravelly loam, very cobbly loam, very gravelly sandy loam, very stony loam, very channery loam

*Clay content:* 12 to 27 percent

*Fragments:* 10 to 60 percent gravel, 0 to 15 percent cobbles, and 0 to 20 percent stones

*Reaction:* slightly to strongly alkaline

*Calcium carbonate equivalent:* 5 to 30 percent

**Daklos Family****Setting**

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* ledge on escarpment

*Parent material:* slope alluvium, residuum

*Elevation:* 5,500 to 6,000 feet (1,677 to 1,829 meters)

*Slope:* 50 to 80 percent

**Climatic data:**

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic  
Lithic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 22 minutes, 20.00 seconds north; longitude 111 degrees, 42 minutes, 4.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 10 percent cobbles, 15 percent stones, and 10 percent boulders

A—0 to 3 inches; brown (7.5YR 5/2), very stony loam, pink (7.5YR 7/3), dry; 19 percent clay; weak fine platy structure; very friable, soft, slightly sticky, nonplastic; common very fine roots; common very fine interstitial and few fine tubular pores; 10 percent gravel, 10 percent cobbles, and 15 percent stones; noneffervescent; moderately alkaline, pH 8.0; clear smooth boundary.

C—3 to 11 inches; brown (7.5YR 4/3), very cobbly loam, light brown (7.5YR 6/3), dry; 23 percent clay; weak medium subangular blocky structure; very friable, soft, slightly sticky, slightly plastic; few very fine roots; many very fine interstitial and few fine pores; 25 percent cobbles and 10 percent channers; slight effervescence; moderately alkaline, pH 8.2, abrupt smooth boundary.

R—11 inches; Straight Cliffs Formation sandstone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 10 to 20 percent gravel, 10 to 20

percent cobbles, 5 to 15 percent stones, and 5 to 15 percent boulders

**Particle-size control section (weighted average):**

*Clay content:* 12 to 27 percent

*Rock fragment content:* 10 to 20 percent gravel, 10 to 20 percent cobbles, 15 to 25 percent stones, and 0 to 5 percent boulders

**A horizon:**

*Chroma:* 2 or 3

**C horizon:**

*Clay content:* 12 to 27 percent

*Fragments:* 10 to 20 percent gravel, 10 to 20 percent cobbles, and 15 to 25 percent stones

*Calcium carbonate equivalent:* 1 to 5 percent

**Dient Series****Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* fan remnants

*Parent material:* colluvium, alluvium

*Elevation:* 4,000 to 5,500 feet (1,220 to 1,677 meters)

*Slope:* 15 to 50 percent

**Climatic data:**

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic  
Typic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 17 minutes, 35.15 seconds north; longitude 111 degrees, 3 minutes, 10.37 seconds west; datum: NAD 83

*Surface fragments:* 8 percent gravel, 10 percent cobbles, 10 percent stones, and 15 percent boulders

A—0 to 4 inches; brown (10YR 4/3), very stony loam, pale brown (10YR 6/3), dry; 18 percent clay; weak fine platy parting to weak fine granular structure; friable, soft, slightly sticky, nonplastic; few very fine and fine roots; common very fine interstitial pores; 15 percent gravel, 10 percent cobbles, and

- 15 percent stones; very slight effervescence; moderately alkaline, pH 8.3; clear wavy boundary.
- C1—4 to 12 inches; olive brown (2.5Y 4/4), very stony loam, light yellowish brown (2.5Y 6/3), dry; 19 percent clay; massive; friable, slightly hard, slightly sticky, nonplastic; few very fine and fine roots; common very fine interstitial pores; 20 percent gravel, 10 percent cobbles, and 20 percent stones; slight effervescence; moderately alkaline, pH 8.3; clear wavy boundary.
- C2—12 to 60 inches; grayish brown (2.5Y 5/2), very stony loam, pale yellow (2.5Y 7/3), dry; 23 percent clay; massive; firm, hard, slightly sticky, slightly plastic; few very fine roots; few very fine interstitial pores; 10 percent gravel, 15 percent cobbles, 15 percent stones, and 10 percent boulders; slight effervescence; moderately alkaline, pH 8.1.

#### Range in Characteristics

*Surface fragments:* 5 to 50 percent gravel, 5 to 15 percent cobbles, 5 to 15 percent stones, and 10 to 20 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 75 percent gravel, cobbles, stones, and boulders

A horizon:

*Hue:* 10YR or 2.5Y

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 2 to 4, dry or moist

*Fragments:* 0 to 15 percent gravel, 0 to 10 percent cobbles, and 0 to 15 percent stones

C horizons:

*Hue:* 10YR or 2.5Y

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 2 to 4, dry or moist

*Texture:* very stony loam, extremely cobbly sandy clay loam, cobbly sandy clay loam

*Clay content:* 18 to 27 percent

*Fragments:* 10 to 25 percent gravel, 10 to 50 percent cobbles, 15 to 20 percent stones, and 0 to 10 percent boulders

*Calcium carbonate equivalent:* 5 to 15 percent

## Earlweed Series

### Setting

*Depth class:* very deep

*Drainage class:* somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* sand sheets on structural benches, dunes on structural benches

*Parent material:* sandstone residuum, eolian sand  
*Elevation:* 5,000 to 6,100 feet (1,524 to 1,860 meters)  
*Slope:* 2 to 20 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Sandy, mixed, mesic Ustic Haplocalcids

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 31 minutes, 22.00 seconds north; longitude 111 degrees, 16 minutes, 32.00 seconds west; datum: NAD 83

A1—0 to 4 inches; reddish brown (5YR 5/4), fine sand, reddish brown (5YR 4/4), dry; 4 percent clay; weak medium subangular blocky parting to single grain; loose, loose, nonsticky, nonplastic; few very fine and fine roots; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

A2—4 to 12 inches; light reddish brown (5YR 6/4), fine sand, reddish brown (5YR 4/4), dry; 5 percent clay; weak medium subangular blocky parting to single grain; loose, loose, nonsticky, nonplastic; common very fine and fine roots; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

Bw—12 to 24 inches; reddish yellow (5YR 6/6), fine sand, yellowish red (5YR 4/6), dry; 6 percent clay; weak coarse subangular blocky parting to single grain; loose, loose, nonsticky, nonplastic; common very fine and fine roots; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

Bk1—24 to 40 inches; reddish yellow (5YR 6/6), fine sand, yellowish red (5YR 4/6), dry; 6 percent clay; weak fine and medium subangular blocky parting to single grain; loose, loose, nonsticky, nonplastic; few very fine and fine roots; discontinuous faint carbonate masses on ped surfaces; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Bk2—40 to 60 inches; pink (5YR 7/4), fine sand, reddish brown (5YR 5/4), dry; 6 percent clay; weak medium subangular blocky structure; slightly hard, loose, nonsticky, nonplastic; few very fine roots; discontinuous faint carbonate masses on ped surfaces; strong effervescence; moderately alkaline, pH 8.4.

### Range in Characteristics

*Depth to secondary carbonates:* 20 to 40 inches

*Particle-size control section (weighted average):*

*Clay content:* 1 to 10 percent

A horizons:

*Hue:* 5YR or 7.5YR

*Value:* 4 to 6 dry; 4 to 6 moist

*Chroma:* 4 to 6, dry or moist

Bw and Bk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 4 to 7 dry; 4 to 7 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* fine sand, loamy fine sand, sand

*Calcium carbonate equivalent:* 5 to 20 percent

## Elias Series

### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* stream terrace, fan remnants

*Parent material:* alluvium

*Elevation:* 5,700 to 6,300 feet (1,738 to 1,921 meters)

*Slope:* 1 to 4 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Fine-loamy, mixed, superactive, mesic Ustic Natrargids

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 29 minutes, 58.82 seconds north; longitude 111 degrees, 57 minutes, 24.81 seconds west; datum: NAD 83

AE—0 to 2 inches; light olive brown (2.5Y 5/3), fine sandy loam, pale yellow (2.5Y 7/3), dry; 15 percent clay; moderate medium platy structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine and medium roots; common very fine and few fine vesicular pores; slight effervescence; strongly alkaline, pH 8.6; abrupt smooth boundary.

Btn—2 to 6 inches; olive brown (2.5Y 4/3), clay loam, light brownish gray (2.5Y 6/2), dry; 31 percent clay; moderate fine and medium prismatic structure; friable, hard, moderately sticky, moderately plastic; common very fine and few fine and medium roots; common very fine and few fine tubular pores; continuous distinct clay films on all faces of peds; slight effervescence; strongly alkaline, pH 8.9; clear wavy boundary.

Btkn—6 to 11 inches; light olive brown (2.5Y 5/4), loam, light yellowish brown (2.5Y 6/3), dry; 20 percent clay; moderate medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine, fine, and medium roots; common very fine and few fine tubular pores; discontinuous distinct clay films on all faces of peds; few fine carbonate veins; strong effervescence; strongly alkaline, pH 8.9; clear wavy boundary.

Bkn1—11 to 13 inches; brown (10YR 5/3), fine sandy loam, light yellowish brown (10YR 6/4), dry; 10 percent clay; weak fine subangular blocky structure; very friable, soft, slightly sticky, slightly plastic; few very fine, fine, and medium roots; common very fine tubular and interstitial pores; common fine carbonate veins; strong effervescence; strongly alkaline, pH 8.5; clear wavy boundary.

Bkn2—13 to 32 inches; brown (10YR 5/3), very fine sandy loam, very pale brown (10YR 7/4), dry; 13 percent clay; weak fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; common fine carbonate veins; strong effervescence; strongly alkaline, pH 8.5; abrupt smooth boundary.

Bkn3—32 to 34 inches; light olive brown (2.5Y 5/3) and brown (10YR 5/3) stratified, stratified fine sandy loam to loam, light brownish gray (2.5Y 6/2) and very pale brown (10YR 7/3) stratified, dry; 21 percent clay; weak fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; common very fine and few fine tubular pores; common fine carbonate veins; violent effervescence; strongly alkaline, pH 8.5; abrupt smooth boundary.

Bk—34 to 60 inches; brown (10YR 5/3), fine sandy loam, very pale brown (10YR 7/4), dry; 10 percent clay; weak fine subangular blocky structure; very friable, soft, slightly sticky, slightly plastic; few very fine and fine roots; many very fine interstitial

and few very fine tubular pores; few fine carbonate veins; strong effervescence; moderately alkaline, pH 8.3; clear smooth boundary.

#### Range in Characteristics

*Depth to secondary carbonates:* 5 to 15 inches

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

Btn and Btkn horizons:

*Hue:* 10YR or 2.5Y

*Value:* 4 or 5 moist

*Chroma:* 2 or 3 dry, 3 or 4 moist

*Clay content:* 18 to 35 percent

*Calcium carbonate equivalent:* 1 to 15 percent

*Electrical conductivity:* 12 to 20 mmhos/cm

*Sodium adsorption ratio:* 13 to 30

*Reaction:* pH 8.5 to 9.0

Bkn horizons:

*Hue:* 10YR or 2.5Y

*Value:* 6 or 7 dry

*Chroma:* 3 or 4

*Electrical conductivity:* 0 to 8 mmhos/cm

*Sodium adsorption ratio:* 13 to 30

*Reaction:* pH 8.5 to 9.0

Bk horizon:

*Calcium carbonate equivalent:* 5 to 15 percent

## Elpedro Series

### Setting

*Local phase:* moist

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Landform:* alluvial flats, valley sides

*Parent material:* alluvium

*Elevation:* 5,450 to 6,560 feet (1,662 to 2,000 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Fine-silty, mixed, superactive, mesic Aridic Haplustalfs

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 21 minutes, 03.54 seconds north; longitude 112

degrees, 12 minutes, 05.96 seconds west; datum: NAD 83

A1—0 to 3 inches; brown (10YR 4/3), silt loam, yellowish brown (10YR 5/4), dry; 8 percent clay; weak fine granular structure; calcium carbonates disseminated throughout; strong effervescence; moderately alkaline, pH 8.4.

A2—3 to 9 inches; brown (10YR 4/3), silt loam, yellowish brown (10YR 5/4), dry; 8 percent clay; weak medium subangular blocky parting to weak fine granular structure; calcium carbonates disseminated throughout; violent effervescence; strongly alkaline, pH 8.6.

Bw—9 to 20 inches; dark grayish brown (10YR 4/2), silt loam, brown (10YR 5/3), dry; 12 percent clay; weak fine and medium subangular blocky structure; 10 percent faint clay films on all faces of peds; calcium carbonates disseminated throughout; violent effervescence; strongly alkaline, pH 8.6.

Bt—20 to 46 inches; brown (10YR 4/3), silt loam, brown (10YR 5/3), dry; 27 percent clay; strong fine and medium subangular blocky structure; 30 percent prominent clay films on all faces of peds; calcium carbonate disseminated throughout; violent effervescence; strongly alkaline, pH 8.6.

Btk—46 to 63 inches; dark grayish brown (10YR 4/2), silty clay loam, yellowish brown (10YR 5/4), dry; 30 percent clay; massive; 20 percent prominent clay films on all faces of peds, 30 percent distinct carbonate coats on surfaces along root channels; violent effervescence; strongly alkaline, pH 8.6.

### Range in Characteristics

*Depth to diagnostic feature:* 5 to 36 inches to argillic horizon

*Calcium carbonate equivalent:* less than 10 percent

*Particle-size control section (weighted average):*

*Clay content:* 27 to 35 percent

Bt and Btk horizons:

*Chroma:* 2 to 4, dry or moist

*Texture:* silty clayloam, silt loam

*Clay content:* 20 to 35 percent

## Emlin Series

### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* fan remnant, remnant stream terraces

*Parent material:* mixed alluvium

*Elevation:* 7,300 to 8,300 feet (2,226 to 2,530 meters)

*Slope:* 5 to 25 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

**Taxonomic class**

Fine-loamy, mixed, superactive, frigid Calcic Argiustolls

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 36 minutes, 18.26 seconds north; longitude 111 degrees, 51 minutes, 55.45 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel

A—0 to 3 inches; dark brown (10YR 3/3), loam, brown (10YR 5/3), dry; 18 percent clay; weak medium and thick platy parting to weak very fine granular structure; very friable, soft, nonsticky, nonplastic; many very fine and fine and few medium roots; many very fine and fine vesicular pores; no effervescence; neutral, pH 6.6; abrupt smooth boundary.

Bt1—3 to 8 inches; very dark grayish brown (10YR 3/2), loam, dark grayish brown (10YR 4/2), dry; 25 percent clay; moderate coarse subangular blocky parting to weak very fine granular structure; very friable, slightly hard, slightly sticky, slightly plastic; many very fine and fine and common medium and few coarse and very coarse roots; many very fine and fine vesicular and few medium tubular pores; 30 percent prominent clay films on all faces of peds; 20 percent gravel; no effervescence; neutral, pH 7.0; clear smooth boundary.

Bt2—8 to 21 inches; dark brown (10YR 3/3), loam, brown (10YR 4/3), dry; 23 percent clay; moderate coarse and very coarse subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic, very weakly cemented by carbonates; common fine and medium and few very fine, coarse, and very coarse roots; common fine vesicular and few medium and coarse tubular pores; 40 percent prominent clay films on all faces of peds; 4 percent gravel; slight effervescence; slightly alkaline, pH 7.6; clear wavy boundary.

Btk—21 to 35 inches; dark yellowish brown (10YR 3/4), clay loam, yellowish brown (10YR 5/4), dry; 29 percent clay; strong coarse and very coarse

angular blocky structure; friable, moderately hard, moderately sticky, moderately plastic, strongly cemented by carbonates; few fine, medium, coarse, and very coarse roots; few fine and medium tubular pores; 10 percent prominent carbonate coats on surfaces along root channels, 65 percent prominent clay films on all faces of peds; 2 percent gravel; violent effervescence; moderately alkaline, pH 8.2; gradual smooth boundary.

Bk1—35 to 46 inches; dark yellowish brown (10YR 3/4), loam, yellowish brown (10YR 5/4), dry; 26 percent clay; massive; friable, hard, moderately sticky, moderately plastic, strongly cemented by carbonates; few medium, coarse and very coarse roots; few fine tubular pores; 5 percent prominent carbonate coats on rock fragments; 10 percent prominent carbonate coats on surfaces along root channels; 3 percent fine prominent irregular carbonate nodules in matrix; 2 percent gravel; violent effervescence; moderately alkaline, pH 8.2; gradual smooth boundary.

Bk2—46 to 60 inches; dark yellowish brown (10YR 3/4), clay loam, yellowish brown (10YR 5/4), dry; 32 percent clay; massive; friable, very hard, moderately sticky, moderately plastic, indurated, cemented by carbonates; few coarse and very coarse roots; few fine tubular pores; 5 percent prominent carbonate coats on rock fragments, 10 percent prominent carbonate coats on surfaces along root channels; 5 percent fine prominent irregular carbonate nodules in matrix, 5 percent medium prominent irregular carbonate masses in matrix; 2 percent gravel; violent effervescence; moderately alkaline, pH 8.4.

**Range in Characteristics**

*Depth to secondary carbonates:* 8 to 20 inches

*Depth to diagnostic feature:* 5 to 14 inches to argillic horizon

*Surface fragments:* 0 to 5 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 25 to 35 percent

*Rock fragment content:* 0 to 20 percent gravel

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 3 to 5 dry; 2 or 3 moist

*Chroma:* 2 or 3, dry or moist

Bt horizon:

*Hue:* 7.5YR or 10YR

*Value:* 3 or 4, moist or dry

*Chroma:* 2 or 3, dry or moist

*Texture:* loam, clay loam

*Clay content:* 18 to 35 percent

Bk and Btk horizons:

*Texture:* loam, clay loam

*Clay content:* 18 to 35 percent

*Calcium carbonate equivalent:* 15 to 30 percent

## Escavada Series

### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 6.0 to 20.0 in/hr (rapid)

*Landform:* alluvial flat, flood plain

*Parent material:* mixed alluvium

*Elevation:* 5,500 to 6,500 feet (1,677 to 1,982 meters)

*Slope:* 0 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Sandy, mixed, mesic Ustic Torrifuvents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 25 minutes, 22.80 seconds north; longitude 111 degrees, 43 minutes, 58.80 seconds west; datum: NAD 83

A—0 to 16 inches; very dark grayish brown (10YR 3/2), fine sand, grayish brown (10YR 5/2), dry; 3 percent clay; weak fine subangular blocky parting to single grain; very friable, soft, nonsticky, nonplastic; many very fine and common fine and few medium and coarse roots; slight effervescence; slightly alkaline, pH 7.8; abrupt smooth boundary.

C1—16 to 29 inches; dark grayish brown (10YR 4/2), loamy sand, light brownish gray (10YR 6/2), dry; 6 percent clay; single grain; common very fine and fine and few medium and coarse roots; slight effervescence; slightly alkaline, pH 7.8; abrupt smooth boundary.

C2—29 to 37 inches; olive brown (2.5Y 4/3), loamy sand, light olive brown (2.5Y 5/3), dry; 5 percent clay; single grain; few very fine and fine roots; slight effervescence; slightly alkaline, pH 7.8; abrupt smooth boundary.

2C—37 to 60 inches; olive brown (2.5Y 4/3), extremely cobbly coarse sand, light olive brown (2.5Y 5/3),

dry; 1 percent clay; single grain; common fine and coarse roots; 35 percent gravel, 40 percent cobbles, and 15 percent stones; noneffervescent; slightly alkaline, pH 7.8.

### Range in Characteristics

*Flooding:* Possible, but rare in July, August and September

*Particle-size control section (weighted average):*

*Clay content:* 1 to 10 percent

C horizons:

*Hue:* 7.5YR to 2.5Y

*Value:* 5 or 6 dry; 4 or 5 moist

*Texture:* loamy sand, extremely cobbly coarse sand

*Fragments:* 0 to 40 percent gravel, 0 to 40 percent cobbles, and 0 to 20 percent stones

Stratified layers of fine sandy loam and silt loam are very common in this soil. These finer layers reduce the infiltration rate to moderately rapid (2.0 to 6.0 in/hr). In areas where the stratified layers are not present, the infiltration rate is rapid (6.0 to 20 in/hr).

## Evpark Series

### Setting

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderate slow)

*Landform:* structural benches and mesas

*Parent material:* slope alluvium, eolian sand

*Elevation:* 5,800 to 7,900 feet (1,765 to 2,409 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 4 minutes, 9.19 seconds north; longitude 112 degrees, 6 minutes, 7.28 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel

A—0 to 5 inches; brown (7.5YR 4/3), fine sandy loam, light brown (7.5YR 6/3), dry; 14 percent clay; weak fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, and medium and few coarse roots; many very fine tubular pores; 5 percent gravel; noneffervescent; neutral, pH 7.2; abrupt wavy boundary.

Bw—5 to 10 inches; dark brown (7.5YR 3/4), loam, light brown (7.5YR 6/4), dry; 16 percent clay; moderate fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, and medium roots and few coarse roots; common very fine, fine, and medium tubular pores; 2 percent gravel; noneffervescent; neutral, pH 7.2; clear wavy boundary.

Bt1—10 to 18 inches; dark brown (7.5YR 3/4), gravelly fine sandy loam, strong brown (7.5YR 4/6), dry; 18 percent clay; moderate fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, and medium and few coarse roots; common very fine, fine, and medium tubular pores; common discontinuous distinct clay films on all faces of peds and in pore channels; 15 percent gravel; noneffervescent; neutral, pH 7.2; clear wavy boundary.

Bt2—18 to 27 inches; dark brown (7.5YR 3/4), loam, strong brown (7.5YR 4/6), dry; 25 percent clay; moderate medium angular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; common very fine and fine and few medium and coarse roots; common very fine and fine and few medium and coarse tubular pores; many continuous distinct clay films on all faces of peds and in pore channels; 2 percent gravel; noneffervescent; neutral, pH 7.2; clear wavy boundary.

Bt3—27 to 33 inches; dark brown (7.5YR 3/4), gravelly clay loam, strong brown (7.5YR 4/6), dry; 38 percent clay; moderate medium angular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; common very fine and fine and few medium roots; common very fine and fine and few medium and coarse tubular pores; many continuous distinct clay films on all faces of peds and in pore channels; 20 percent gravel; noneffervescent; slightly alkaline, pH 7.4; abrupt smooth boundary.

R—33 inches; Entrada formation sandstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Surface fragments:* 0 to 10 percent gravel and 0 to 5 percent cobbles

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 5 percent, dominantly gravel

A horizons:

*Hue:* 7.5YR or 10YR

*Value:* 3 or 4 moist

*Chroma:* 3 or 4

*Fragments:* 0 to 5 percent gravel

Bw horizon (if present):

*Hue:* 7.5YR or 10YR

*Value:* 4 to 6 dry; 3 or 4 moist

*Chroma:* 3 or 4

*Fragments:* 0 to 5 percent gravel

Bt and Btk horizons:

*Value:* 4 to 7 dry; 3 to 6 moist

*Chroma:* 3 to 6

*Texture:* loam, gravelly very fine sandy loam, gravelly loam

*Clay content:* 18 to 35 percent

*Fragments:* 0 to 20 percent gravel

*Calcium carbonate equivalent:* 0 to 5 percent

## Flatnose Series

### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (slow)

*Landform:* drainageway, alluvial flat

*Parent material:* alluvium

*Elevation:* 5,450 to 6,030 feet (1,662 to 1,837 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, calcareous, mesic  
Typic Ustifluvents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 9 minutes, 9.01 seconds north; longitude 112 degrees, 16 minutes, 3.30 seconds west; datum: NAD 83

- A—0 to 13 inches; red (2.5YR 4/6), fine sand, light red (2.5YR 6/6), dry; 8 percent clay; single grain; very slight effervescence; slightly alkaline, pH 7.6.
- C—13 to 16 inches; dark yellowish brown (10YR 4/4), fine sandy loam, light yellowish brown (10YR 6/4), dry; 12 percent clay; massive; very slight effervescence; slightly alkaline, pH 7.8.
- 2C1—16 to 31 inches; brown (7.5YR 4/4), loam, light brown (7.5YR 6/3), dry; 25 percent clay; massive; very slight effervescence; moderately alkaline, pH 8.0.
- 2C2—31 to 41 inches; yellowish red (5YR 4/6), loamy sand, light reddish brown (5YR 6/4), dry; 12 percent clay; single grain; very slight effervescence; moderately alkaline, pH 8.0.
- 3C1—41 to 52 inches; yellowish brown (10YR 5/6), sand, light yellowish brown (10YR 6/4), dry; 4 percent clay; massive; strong effervescence; moderately alkaline, pH 8.2.
- 3C2—52 to 60 inches; brown (7.5YR 5/4), silt loam, reddish brown (7.5YR 6/6), dry; 20 percent clay; massive; strong effervescence; moderately alkaline, pH 8.2.

**Range in Characteristics**

*Depth to diagnostic feature:* 15 to 30 inches to argillic horizon

*Particle-size control section (weighted average):*

*Clay content:* 10 to 18 percent

Btkb horizons:

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6, dry or moist

*Texture:* loam, silt loam

*Clay content:* 8 to 18 percent

Bkb horizon:

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6, dry or moist

*Calcium carbonate equivalent:* 15 to 30 percent

C horizons:

*Hue:* 5YR to 10YR

*Value:* 3 to 5 moist

*Chroma:* 3 to 6

*Texture:* fine sandy loam, loamy sand, loam, sand

**Fourmilebench Series****Setting**

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* structural benches, dipslopes of cuestas

*Parent material:* residuum, colluvium

*Elevation:* 5,000 to 6,200 feet (1,524 to 1,890 meters)

*Slope:* 15 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, mesic Lithic Ustic  
Haplargids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 19 minutes, 86.00 seconds north; longitude 111 degrees, 43 minutes, 21.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 10 percent cobbles, 15 percent channers, 15 percent flagstones, and 5 percent stones

A—0 to 2 inches; dark yellowish brown (10YR 4/4), extremely flaggy loamy sand, pale brown (10YR 6/3), dry; 5 percent clay; weak fine platy parting to weak fine granular structure; very friable, soft, nonsticky, nonplastic; few fine and medium roots; many very fine interstitial pores; 10 percent gravel, 10 percent cobbles, 15 percent channers, 20 percent flagstones, and 10 percent stones; slight effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

Bt—2 to 7 inches; brown (7.5YR 4/3), very flaggy sandy loam, brown (7.5YR 5/3), dry; 17 percent clay; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; few fine and medium roots; common very fine interstitial and few fine tubular pores; 5 percent gravel, 5 percent cobbles, 15 percent channers, 20 percent flagstones, and 10 percent stones; few faint clay films on faces of peds; slight effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

R—7 inches; Wahweap Formation sandstone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Depth to diagnostic feature:* 1 to 14 inches to argillic horizon

*Surface fragments:* 5 to 15 percent gravel, 5 to 15 percent cobbles, 10 to 20 percent channers, 10 to 20 percent flagstones, and 0 to 10 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 12 to 27 percent

*Rock fragment content:* 35 to 70 percent gravel, cobbles, channers, flagstones, and stones

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 4 to 6 dry; 3 to 5 moist

*Chroma:* 2 to 4

Bt horizon:

*Hue:* 5YR to 10YR

*Value:* 4 to 6 dry; 3 to 5 moist

*Chroma:* 2 to 6 dry or moist

*Clay content:* 12 to 27 percent

*Fragments:* 35 to 70 percent gravel, cobbles, channers, flagstones, and stones

**Frandsen Series****Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* alluvial flat, mountain footslopes

*Parent material:* alluvium

*Elevation:* 7,300 to 7,800 feet (2,226 to 2,378 meters)

*Slope:* 1 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 16 to 20 inches (406 to 508 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

**Taxonomic class**

Fine-loamy, mixed, superactive, frigid Aridic Haplustepts

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 35 minutes, 3.60 seconds north; longitude 111 degrees, 50 minutes, 41.96 seconds west; datum: NAD 83

A1—0 to 4 inches; dark grayish brown (10YR 4/2), loam, light brownish gray (10YR 6/2), dry; 20 percent clay; moderate very fine granular structure; loose, loose, slightly sticky, slightly plastic; many very fine and fine and few medium roots; many very fine interstitial pores; violent effervescence; moderately alkaline, pH 8.0; gradual smooth boundary.

A2—4 to 12 inches; very dark grayish brown (10YR 3/2), loam, grayish brown (10YR 5/2), dry; 22 percent clay; strong fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; many very fine and fine and few medium roots; many very fine interstitial pores; violent effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

C—12 to 44 inches; grayish brown (10YR 5/2), loam, light brownish gray (10YR 6/2), dry; 18 percent clay; massive; slightly sticky, slightly plastic; few very fine, fine, and medium roots; common fine and few coarse tubular pores; violent effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

2C—44 to 60 inches; very dark grayish brown (10YR 3/2), silt loam, grayish brown (10YR 5/2), dry; 22 percent clay; massive; slightly sticky, slightly plastic; few very fine, fine, and medium roots; few coarse tubular pores; violent effervescence; moderately alkaline, pH 8.2.

**Range in Characteristics**

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

A horizon:

*Hue:* 5YR to 10YR

*Value:* 5 or 6 dry; 3 or 4 moist

*Chroma:* 2 to 4, dry or moist

C horizons:

*Hue:* 5YR to 10YR

*Value:* 5 or 6 dry; 3 to 5 moist

*Chroma:* 2 to 4, dry or moist

*Texture:* loam, silt loam

*Clay content:* 18 to 27 percent

**Gaddes Family****Setting**

*Depth class:* shallow to moderately deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* escarpment on structural bench

*Parent material:* colluvium over residuum  
*Elevation:* 5,500 to 6,500 feet (1,677 to 1,982 meters)  
*Slope:* 15 to 60 percent

**Climatic data:**

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Ustic Haplargids

**Typical Pedon**

*Location in survey area:* about latitude 37 degrees, 54 minutes, 30.40 seconds north; longitude 111 degrees, 15 minutes, 11.80 seconds west; datum: NAD 83

*Surface fragments:* 20 percent gravel, 10 percent cobbles, 5 percent channers, 35 percent stones, and 20 percent boulders

A—0 to 1 inch; brown (7.5YR 5/4), extremely bouldery loam, light brown (7.5YR 6/4), dry; 12 percent clay; moderate thick platy structure; very friable, soft, slightly sticky, slightly plastic; 20 percent gravel, 10 percent cobbles, 5 percent channers, 35 percent stones, and 20 percent boulders; slight effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Bw—1 to 18 inches; brown (7.5YR 4/4), very gravelly loam, strong brown (7.5YR 5/6), dry; 16 percent clay; weak medium subangular blocky parting to weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine and medium and many fine and few coarse roots; 40 percent gravel and 5 percent channers; slight effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

2Bt—18 to 32 inches; reddish brown (2.5YR 4/4), clay loam, reddish brown (5YR 4/4), dry; 27 percent clay; moderate medium angular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; few very fine and fine roots; common very fine and few fine tubular pores; common distinct clay films in pores and clay as bridges between mineral grains; 12 percent gravel; slight effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

Cr—32 inches; weathered Chinle Formation bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Thickness of diagnostic feature:* 15-inch-thick argillic horizon

*Surface fragments:* 15 to 25 percent gravel, 5 to 15 percent cobbles, 0 to 10 percent channers, 30 to 40 percent stones, and 15 to 25 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 30 percent gravel, 2 percent cobbles, 5 percent channers, 9 percent stones, and 5 percent boulders

Bw horizon:

*Chroma:* 4 to 6

*Clay content:* 8 to 18 percent

*Fragments:* 35 to 45 percent gravel and 0 to 10 percent channers

2Bt horizon:

*Hue:* 2.5YR or 5YR

*Clay content:* 18 to 35 percent

*Fragments:* 10 to 15 percent gravel

**Gerst Family**

**Setting**

*Depth class:* shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* structural bench, hillslope

*Parent material:* colluvium, residuum

*Elevation:* 5,000 to 5,800 feet (1,524 to 1,768 meters)

*Slope:* 20 to 50 percent

**Climatic data:**

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* about latitude 37 degrees, 33 minutes, 13.00 seconds north; longitude 111 degrees, 32 minutes, 1.00 seconds west; datum: NAD 83

A—0 to 3 inches; dark reddish brown (5YR 3/4), loam, reddish brown (5YR 5/3), dry; 18 percent clay; weak fine granular structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; common fine and medium pores; moderately alkaline, pH 8.4; abrupt smooth boundary.

C—3 to 12 inches; reddish brown (5YR 4/3), loam, reddish brown (5YR 5/3), dry; 18 percent clay; massive; friable, slightly hard, slightly sticky, slightly plastic; few very fine, fine, and medium roots; few very fine and fine pores; 5 percent gravel; moderately alkaline, pH 8.0; clear wavy boundary.

Cr—12 inches; weathered Straight Cliffs Formation bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Surface fragments:* 20 to 40 percent, dominantly gravel

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 10 to 20 percent, dominantly gravel and channers

A horizon:

*Hue:* 5YR to 2.5Y

*Value:* 5 or 6 dry; 3 to 5 moist

*Chroma:* 3 or 4

C horizons:

*Hue:* 5YR to 2.5Y

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 6

*Texture:* loam, sandy loam

*Fragments:* 0 to 20 percent gravel and 0 to 20 percent parachanners or channers

## Gompers Family

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* ledge on escarpment

*Parent material:* slope alluvium, colluvium, residuum

*Elevation:* 6,500 to 7,500 feet (1,982 to 2,287 meters)

*Slope:* 50 to 80 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, calcareous, frigid  
Aridic Lithic Ustorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 16 minutes, 23.00 seconds north; longitude 111 degrees, 4 minutes, 40.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 10 percent cobbles, 15 percent stones, and 10 percent boulders

A—0 to 4 inches; brown (10YR 4/3), very stony loam, brown (10YR 5/3), dry; 21 percent clay; weak medium platy structure; 10 percent gravel, 10 percent cobbles, and 15 percent stones; very slight effervescence; moderately alkaline, pH 8.0.

C—4 to 13 inches; dark grayish brown (10YR 4/2), very stony loam, grayish brown (10YR 5/2), dry; 24 percent clay; massive; 10 percent gravel, 10 percent cobbles, and 25 percent stones; slight effervescence; moderately alkaline, pH 8.2.

R—13 inches; Straight Cliffs Formation bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 5 to 15 percent gravel, 5 to 15 percent cobbles, 10 to 20 percent stones, and 5 to 15 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 30 to 50 percent gravel, cobbles, and stones

A horizon:

*Value:* 5 to 8 dry; 4 to 6 moist

*Chroma:* 2 to 4

C horizon:

*Value:* 5 to 8 dry; 4 to 6 moist

*Chroma:* 2 to 4

*Fragments:* 5 to 15 percent gravel, 5 to 15 percent cobbles, and 20 to 30 percent stones

## Green River Series

### Setting

*Depth class:* very deep  
*Drainage class:* moderately well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Landform:* channel, flood plain  
*Parent material:* mixed recent alluvium  
*Elevation:* 4,300 to 5,400 feet (1,311 to 1,646 meters)  
*Slope:* 0 to 5 percent

### Climatic data:

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

### Taxonomic class

Coarse-loamy, mixed, superactive, calcareous, mesic  
 Oxyaquic Torrifluvents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 14 minutes, 58.68 seconds north; longitude 111 degrees, 57 minutes, 16.70 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel

- A—0 to 7 inches; brown (10YR 4/3), fine sandy loam, pale brown (10YR 6/3), dry; 14 percent clay; weak thin platy structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine tubular and interstitial pores; 2 percent gravel; very slight effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.
- C1—7 to 14 inches; brown (7.5YR 5/4), fine sandy loam, pink (7.5YR 7/3), dry; 16 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine interstitial and tubular pores; slight effervescence; strongly alkaline, pH 8.5; abrupt smooth boundary.
- C2—14 to 29 inches; yellowish brown (10YR 5/4), loamy fine sand, very pale brown (10YR 7/3), dry; 6 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; 2 percent gravel; very slight effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.
- C3—29 to 37 inches; brown (10YR 5/3), loamy fine sand, pale brown (10YR 6/3), dry; 5 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; 20 percent fine

distinct brownish yellow (10YR 6/6), dry, iron-manganese concretions; very slight effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

Ab—37 to 41 inches; brown (10YR 4/3), fine sandy loam, pale brown (10YR 6/3), dry; 19 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; few very fine and fine tubular and common very fine interstitial pores; 20 percent fine distinct brownish yellow (10YR 6/6), dry and yellowish brown (10YR 5/6), dry, iron-manganese concretions; slight effervescence; moderately alkaline, pH 8.3; abrupt wavy boundary.

Cb1—41 to 48 inches; yellowish brown (10YR 5/4), loamy fine sand, very pale brown (10YR 7/3), dry; 6 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; 20 percent fine distinct brownish yellow (10YR 6/6), dry, iron-manganese concretions; 2 percent gravel; slight effervescence; moderately alkaline, pH 8.1; abrupt wavy boundary.

Cb2—48 to 63 inches; brown (10YR 5/3), gravelly loamy fine sand, very pale brown (10YR 7/4), dry; 4 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine and fine interstitial pores; 20 percent fine distinct brownish yellow (10YR 6/6), dry, iron-manganese concretions; 20 percent gravel and 5 percent cobbles; slight effervescence; moderately alkaline, pH 8.1.

### Range in Characteristics

*Depth to redoximorphic features:* 0 to 30 inches  
*Surface fragments:* 0 to 5 percent gravel  
*Flooding:* Rare to occasional in July, August, and September  
*Particle-size control section (weighted average):*  
*Clay content:* 5 to 18 percent

C and Cb horizons:

*Hue:* 7.5YR or 10YR  
*Value:* 6 or 7 dry; 5 moist  
*Chroma:* 3 or 4, dry or moist  
*Texture:* fine sandy loam, loamy fine sand  
*Fragments:* 0 to 20 percent rounded gravel and 0 to 5 percent rounded cobbles

## Hanksville Series

### Setting

*Depth class:* moderately deep  
*Drainage class:* well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Landform:* hillslope

*Parent material:* shale residuum

*Elevation:* 3,800 to 4,800 feet (1,159 to 1,463 meters)

*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Fine, mixed, active, calcareous, mesic Typic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 8 minutes, 34.00 seconds north; longitude 111 degrees, 54 minutes, 43.70 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel and 2 percent channers

A—0 to 3 inches; light olive brown (2.5Y 5/3) silty clay loam, light yellowish brown (2.5Y 6/3), dry; 32 percent clay; moderate thin platy structure over moderate very fine granular structure; very friable, soft, moderately sticky, moderately plastic; common very fine and few fine and medium roots; common very fine and fine vesicular and very fine tubular pores; 5 percent gravel; strong effervescence; strongly alkaline, pH 8.5; clear wavy boundary.

C—3 to 17 inches; light olive brown (2.5Y 5/3), silty clay loam, light yellowish brown (2.5Y 6/3), dry; 36 percent clay; weak coarse subangular blocky structure; friable, hard, moderately sticky, moderately plastic; common very fine and few fine and medium roots; few very fine and fine tubular pores; strong effervescence; strongly alkaline, pH 8.7; clear wavy boundary.

Cyz1—17 to 31 inches; light olive brown (2.5Y 5/3), silty clay loam, light yellowish brown (2.5Y 6/3), dry; 36 percent clay; weak fine subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; few very fine roots; few very fine tubular pores; 5 percent parachanners; common gypsum and salt crystals throughout; strong effervescence; strongly alkaline, pH 8.7; gradual wavy boundary.

Cyz2—31 to 38 inches; light olive brown (2.5Y 5/3), parachannery silty clay loam, light brownish gray (2.5Y 6/2), dry; 37 percent clay; massive; friable,

slightly hard, moderately sticky, moderately plastic; few very fine roots; 5 percent gravel and 15 percent parachanners; strong effervescence; strongly alkaline, pH 8.6; clear smooth boundary. Cr—38 inches to weathered Tropic Shale bedrock

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Depth to diagnostic feature:* 10 to 20 inches to gypsic and salic horizon

*Surface fragments:* 0 to 5 percent gravel and 0 to 5 percent parachanners

*Particle-size control section (weighted average):*

*Clay content:* 35 to 55 percent

*Rock fragment content:* 5 to 15 percent gravel and channers

C and Cyz horizons:

*Chroma:* 2 to 3, dry or moist

*Clay content:* 35 to 55 percent

*Fragments:* 0 to 10 percent gravel and 0 to 20 percent parachanners

*Calcium carbonate equivalent:* 15 to 30 percent

*Gypsum content:* 1 to 10 percent

*Electrical conductivity:* 2 to 16 mmhos/cm

**Henrieville Series**

**Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* alluvial flats, stream terraces

*Parent material:* recent alluvium

*Elevation:* 6,000 to 7,200 feet (1,829 to 2,195 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 36 minutes, 7.86 seconds north; longitude 111 degrees, 56 minutes, 18.04 seconds west; datum: NAD 83

- A—0 to 5 inches; grayish brown (2.5Y 5/2), sandy loam, light yellowish brown (2.5Y 6/3), dry; 10 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common fine and medium roots; many fine vesicular pores; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.
- C1—5 to 13 inches; grayish brown (2.5Y 5/2), sandy loam, light yellowish brown (2.5Y 6/3), dry; 15 percent clay; subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common fine and medium roots; few fine, medium, and coarse pores; carbonates finely disseminated throughout; strong effervescence; moderately alkaline, pH 8.3; clear smooth boundary.
- C2—13 to 24 inches; light olive brown (2.5Y 5/3), sandy loam, light yellowish brown (2.5Y 6/3), dry; 17 percent clay; massive; carbonates finely disseminated throughout; strong effervescence; moderately alkaline, pH 8.3; clear smooth boundary.
- C3—24 to 41 inches; light olive brown (2.5Y 5/4), loamy sand, light yellowish brown (2.5Y 6/4), dry; 10 percent clay; massive; carbonates finely disseminated throughout; strong effervescence; moderately alkaline, pH 8.3; clear smooth boundary.
- C4—41 to 61 inches; light olive brown (2.5Y 5/4), loamy sand, light yellowish brown (2.5Y 6/4), dry; 10 percent clay; massive; carbonates finely disseminated throughout; strong effervescence; moderately alkaline, pH 8.3; abrupt smooth boundary.
- C5—61 to 69 inches; light olive brown (2.5Y 5/4), gravelly loamy sand, light yellowish brown (2.5Y 6/3), dry; 7 percent clay; massive; carbonates finely disseminated throughout; 20 percent gravel; strong effervescence; moderately alkaline, pH 8.3; clear smooth boundary.
- C6—69 inches; light olive brown (2.5Y 5/4), sand, light yellowish brown (2.5Y 6/3), dry; 4 percent clay; massive; carbonates finely disseminated throughout; strong effervescence; moderately alkaline, pH 8.3; abrupt smooth boundary.

#### Range in Characteristics

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent

C horizons:

*Chroma:* 2 to 4, dry and moist

*Fragments:* 0 to 20 percent gravel

## Hetz Series

### Setting

*Depth class:* very deep

*Drainage class:* poorly drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* drainageway on structural bench

*Parent material:* alluvium

*Elevation:* 7,000 to 7,500 feet (2,134 to 2,287 meters)

*Slope:* 0 to 3 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F.  
(7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Fine-loamy, mixed, superactive, calcareous, mesic  
 Typic Endoaquolls

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 16 minutes, 37.00 seconds north; longitude 111 degrees, 7 minutes, 38.00 seconds west; datum: NAD 83

Oe—8 to 7 inches; slightly decomposed plant material.

Oi—7 to 0 inches; moderately decomposed plant material.

A—0 to 5 inches; very dark gray (10YR 3/1), sandy loam, dark gray (10YR 4/1), dry; 16 percent clay; weak fine granular structure; many very fine and fine roots; noneffervescent; slightly alkaline, pH 7.4; clear smooth boundary.

Bg1—5 to 9 inches; black (10YR 2/1), reduced matrix, sandy loam, light brownish gray (10YR 6/2), dry; 18 percent clay; common very fine and fine roots; noneffervescent; slightly alkaline, pH 7.4; clear smooth boundary.

Bg2—9 to 18 inches; dark gray (2.5Y 4/1), reduced matrix, sandy clay loam, light brownish gray (2.5Y 6/2), dry; 27 percent clay; few very fine roots; noneffervescent; slightly alkaline, pH 7.8; clear smooth boundary.

Cg1—18 to 44 inches; very dark grayish brown (2.5Y 3/2), reduced matrix, sandy clay loam, light brownish gray (2.5Y 6/2), dry; 29 percent clay; noneffervescent; slightly alkaline, pH 7.8; clear smooth boundary.

Cg2—44 to 63 inches; very dark gray (2.5Y 3/1), reduced matrix, sandy clay loam, light brownish gray (2.5Y 6/2), dry; 29 percent clay; noneffervescent; slightly alkaline, pH 7.8; clear smooth boundary.

#### Range in Characteristics

*Depth to diagnostic feature:* 3 to 10 inches to gleyed horizon

*Endosaturation:* Between a depth of 0 to 20 inches from March through May

*Particle-size control section (weighted average):*  
*Clay content:* 28 to 35 percent

Bg horizons:

*Hue:* 10YR to 2.5Y

*Chroma:* 1 or 2, dry and moist

*Texture:* sandy loam, sandy clay loam

Cg horizons:

*Chroma:* 1 or 2

### Hideout Series

#### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* structural bench, hillslopes

*Parent material:* residuum and eolian sand

*Elevation:* 4,800 to 6,700 feet (1,463 to 2,043 meters)

*Slope:* 2 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### Taxonomic class

Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 48 minutes, 24.56 seconds north; longitude 111 degrees, 10 minutes, 53.45 seconds west; datum: NAD 83

*Surface fragments:* 50 percent channers and 25 percent flagstones

A1—0 to 1 inch; yellowish brown (10YR 5/4), extremely channery loamy sand; light yellowish brown (10YR

6/4), dry; 10 percent clay; strong thick platy structure; loose, soft, nonsticky, nonplastic; 65 percent channers and 25 percent flagstones; very slight effervescence; moderately alkaline, pH 8.2.

A2—1 to 5 inches; yellowish brown (10YR 5/4), sandy loam; light yellowish brown (10YR 6/4), dry; 12 percent clay; strong very fine granular structure; loose, soft, nonsticky, nonplastic; 2 percent gravel; strong effervescence; moderately alkaline, pH 8.2.

Cr—5 to 9 inches; weathered bedrock; massive; very slight effervescence; moderately alkaline, pH 8.2.

R—9 inches; Chile Formation, Shinarump conglomerate bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 5 to 20 inches to bedrock (paralithic)

*Surface fragments:* 25 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent stones

*Particle-size control section (weighted average):*  
*Clay content:* 5 to 18 percent

*Rock fragment content:* 10 to 35 percent gravel and channers

A horizons:

*Hue:* 7.5YR or 10YR

*Value:* 4 to 6 dry

*Chroma:* 3 or 4

*Fragments:* 0 to 15 percent gravel, 55 to 75 percent channers, and 0 to 25 percent flagstones

C horizon (when present):

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 or 4

*Fragments:* 5 to 25 percent gravel and 25 to 35 percent channers

### Hillburn Series

#### Setting

*Local phase:* dry

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* hillslopes, structural benches, escarpments on structural benches

*Parent material:* burnt sandstone and shale residuum and colluvium

*Elevation:* 4,800 to 7,200 feet (1,463 to 2,195 meters)

*Slope:* 2 to 70 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 23 minutes, 10.00 seconds north; longitude 111 degrees, 26 minutes, 41.00 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel, 10 percent cobbles, 10 percent channers, 10 percent flagstones, and 10 percent stones

A—0 to 2 inches; reddish brown (5YR 4/3), very channery loam, light reddish brown (5YR 6/4), dry; 21 percent clay; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine, fine, and medium roots; many very fine interstitial pores; 15 percent gravel, 10 percent cobbles, 15 percent channers and 5 percent flagstones; slight effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

C1—2 to 7 inches; reddish brown (5YR 4/4), very flaggy loam, reddish brown (5YR 5/4), dry; 23 percent clay; weak fine granular structure; very friable, soft, slightly sticky, nonplastic; few very fine, fine, and medium roots; many very fine interstitial pores; 10 percent gravel, 10 percent cobbles, 15 percent channers, and 10 percent flagstones; strong effervescence; carbonates are disseminated; moderately alkaline, pH 8.0; gradual wavy boundary.

C2—7 to 13 inches; reddish brown (5YR 5/4), very channery loam, light reddish brown (5YR 6/3), dry; 24 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; few very fine and fine roots; many very fine interstitial pores; 15 percent gravel, 10 percent cobbles, 15 percent channers, and 5 percent flagstones; strong effervescence; carbonates are disseminated; moderately alkaline, pH 8.0; clear wavy boundary.

R—13 inches; Straight Cliffs Formation sandstone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 5 to 25 percent gravel, 5 to 15 percent cobbles, 5 to 75 percent channers, 0 to 15 percent flagstones, 5 to 20 percent stones, and 5 to 45 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 75 percent gravel, cobbles, channers, and flagstones

## A horizons:

*Hue:* 2.5YR to 7.5YR

*Value:* 4 to 6 dry; 3 or 4 moist

*Chroma:* 3 to 6, dry or moist

*Fragments:* 0 to 20 percent gravel, 0 to 10 percent cobbles, 15 to 70 percent channers, and 0 to 20 percent flagstones

## C horizons:

*Hue:* 2.5YR to 7.5YR

*Value:* 4 to 6 dry; 3 to 5 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* loam, silt loam and clay loam, with appropriate modifier

*Fragments:* 5 to 80 percent gravel, 0 to 15 percent cobbles, 10 to 50 percent channers, and 0 to 15 percent flagstones

**Horsemountain Series****Setting**

*Local phase:* moist

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* remnant stream terrace, fan remnant

*Parent material:* alluvium

*Elevation:* 4,700 to 7,200 feet (1,433 to 2,195 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy, mixed, superactive, mesic, shallow Ustalfic Petrocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 31 minutes, 6.94 seconds north; longitude 112

degrees, 2 minutes, 0.56 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel and 2 percent cobbles

A—0 to 4 inches; brown (7.5YR 4/3), fine sandy loam, light brown (7.5YR 6/4), dry; 9 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; many very fine interstitial and tubular pores; 3 percent gravel and 1 percent cobbles; noneffervescent; slightly alkaline, pH 7.5; abrupt wavy boundary.

Bt—4 to 7 inches; reddish brown (5YR 4/4), loam, light reddish brown (5YR 6/4), dry; 20 percent clay; moderate fine and medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common very fine, fine, and medium tubular pores; common thin clay films on all faces of peds and on surfaces along pores; 8 percent gravel and 1 percent cobbles; very slight effervescence; slightly alkaline, pH 7.8; clear wavy boundary.

Btk—7 to 14 inches; reddish brown (5YR 5/4), gravelly fine sandy loam, light reddish brown (5YR 6/4), dry; 17 percent clay; moderate fine and medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common very fine, fine, and medium tubular pores; common fine carbonate veins and few to common thin clay films on surfaces along pores and on all faces of peds; 15 percent gravel and 2 percent cobbles; strong effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

Bkm—14 to 19 inches; light brown (7.5YR 6/4), extremely gravelly loamy sand, pink (7.5YR 7/3), dry; 5 percent clay; massive; indurated petrocalcic layer of strong effervescence, moderately to weakly cemented by calcium carbonates; root penetration is inhibited except through a few vertical fractures; common very fine and few fine and medium roots; 0.5 to 1 inch thick laminar cap; 60 percent gravel, 10 percent cobbles, and 3 percent stones; violent effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

Bk1—19 to 32 inches; yellowish brown (10YR 5/4), very gravelly fine sandy loam, yellow (10YR 7/6), dry; 9 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine and medium roots; many very fine interstitial and few very fine and fine tubular pores; moderately thick

carbonate coats on rock fragments; 50 percent gravel, 7 percent cobbles, and 1 percent stones; violent effervescence; moderately alkaline, pH 8.3; clear wavy boundary.

Bk2—32 to 61 inches; light yellowish brown (2.5Y 6/4), extremely gravelly loamy fine sand, pale yellow (2.5Y 7/4), dry; 4 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and few fine and medium roots; many very fine and few fine interstitial pores; moderately thick carbonate coats on rock fragments; 60 percent gravel, 10 percent cobbles, and 1 percent stones; violent effervescence; moderately alkaline, pH 8.2; abrupt wavy boundary.

Bk3—61 to 69 inches; brown (7.5YR 5/4), gravelly fine sandy loam, pink (7.5YR 7/4), dry; 14 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine and medium roots; common very fine tubular and many very fine interstitial pores; thin carbonate coats on rock fragments; 30 percent gravel and 2 percent cobbles; strong effervescence; moderately alkaline, pH 8.1.

#### Range in Characteristics

*Depth to restrictive feature:* 8 to 20 inches to cemented horizon

*Depth to diagnostic feature:* 7 to 20 inches to secondary carbonates; 8 to 20 inches to petrocalcic horizon; 4 to 14 inches to argillic horizon

*Surface fragments:* 0 to 10 percent gravel and 0 to 5 percent cobbles

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 15 to 35 percent, mostly gravel

A horizon:

*Hue:* 5YR to 10YR

*Value:* 4 to 6 dry; 4 to 6 moist

*Chroma:* 2 to 4, dry or moist

Bt and Btk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6, dry or moist

*Clay content:* 18 to 35 percent

*Fragments:* 0 to 20 percent gravel and 0 to 10 percent cobbles

*Calcium carbonate equivalent:* 1 to 15 percent

Bkm to Bk horizons:

*Hue:* 5YR to 2.5Y

*Value:* 5 to 8 dry; 4 to 7 moist  
*Chroma:* 3 to 6, dry or moist  
*Texture:* very gravelly fine sandy loam, extremely gravelly loamy fine sand, gravelly fine sandy loam  
*Clay content:* 5 to 20 percent  
*Fragments:* 25 to 65 percent gravel, 0 to 15 percent cobbles, and 0 to 10 percent stones  
*Calcium carbonate equivalent:* 15 to 40 percent

## Humbug Series

### Setting

*Local phase:* moist  
*Depth class:* deep  
*Drainage class:* well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Landform:* structural bench  
*Parent material:* eolian sand and slope alluvium over residuum  
*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)  
*Slope:* 2 to 20 percent  
*Climatic data:*  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

### Taxonomic class

Coarse-loamy, gypsic, mesic Ustic Calcigypsis

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 12 minutes, 24.52 seconds north; longitude 111 degrees, 57 minutes, 45.02 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel

A—0 to 3 inches; reddish brown (5YR 4/3), very fine sandy loam, light reddish brown (5YR 6/3), dry; 18 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; strong effervescence; moderately alkaline, pH 7.9; abrupt wavy boundary.  
 Bw—3 to 5 inches; reddish brown (5YR 4/4), very fine sandy loam, light reddish brown (5YR 6/4), dry; 19 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few

medium and coarse roots; strong effervescence; moderately alkaline, pH 8.0; clear wavy boundary.  
 Bk—5 to 15 inches; reddish brown (5YR 5/4), fine sandy loam, pink (5YR 7/4), dry; 15 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common calcium carbonate veins; violent effervescence; moderately alkaline, pH 8.3; clear wavy boundary.  
 Bky—15 to 17 inches; yellowish red (5YR 5/6), fine sandy loam, reddish yellow (5YR 7/6), dry; 17 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium roots; common calcium carbonate veins and gypsum veins; 5 percent channers; strong effervescence; moderately alkaline, pH 8.1; abrupt wavy boundary.  
 By1—17 to 22 inches; light gray (10YR 7/2), fine sandy loam, very pale brown (10YR 8/2), dry; 14 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium roots; many gypsum veins and crystals; 5 percent gravel and 5 percent parachanners; slight effervescence; slightly alkaline, pH 7.8; clear wavy boundary.  
 By2—22 to 44 inches; reddish brown (5YR 5/4), parachannery fine sandy loam, pink (5YR 7/4), dry; 15 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine roots; many medium gypsum crystals; 10 percent gravel and 10 percent parachanners; slight effervescence; slightly alkaline, pH 7.8; clear smooth boundary.  
 BCy—44 to 49 inches; 65 percent brown (7.5YR 4/4), 35 percent light brownish gray (2.5Y 6/2), very parachannery fine sandy loam, 65 percent reddish yellow (7.5YR 6/6), 35 percent pale yellow (2.5Y 7/3), dry; 14 percent clay; weak fine and medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; many medium gypsum crystals; 20 percent channers and 15 percent parachanners; slight effervescence; moderately alkaline, pH 8.1; abrupt smooth boundary.  
 Cr—49 inches; weathered Moenkopi Formation interbedded shale and sandstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)

*Depth to diagnostic feature:* 8 to 18 inches to gypsic horizon; 2 to 12 inches to secondary carbonates  
*Surface fragments:* 0 to 5 percent gravel  
*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent  
*Rock fragment content:* 0 to 10 percent gravel and 0 to 15 percent channers

Bk horizon:

*Calcium carbonate equivalent:* 10 to 25 percent

Bky horizon:

*Fragments:* 0 to 10 percent channers  
*Calcium carbonate equivalent:* 5 to 20 percent  
*Gypsum content:* 5 to 70 percent

By horizons:

*Hue:* 5YR to 10YR  
*Value:* 7 or 8 dry; 5 to 7 moist  
*Chroma:* 2 to 4, dry or moist  
*Fragments:* 0 to 15 percent gravel and 0 to 15 percent channers  
*Calcium carbonate equivalent:* 3 to 10 percent  
*Gypsum content:* 40 to 70 percent

BCy horizon:

*Hue:* 7.5YR to 2.5Y  
*Value:* 6 or 7 dry; 4 to 6 moist  
*Chroma:* 2 to 6, dry or moist  
*Fragments:* 30 to 40 percent parachanners  
*Gypsum content:* 40 to 70 percent

## Jocity Series

### Setting

*Local phase:* saline  
*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Landform:* alluvial fan, flood plain, stream terrace  
*Parent material:* alluvium  
*Elevation:* 4,400 to 4,900 feet (1,341 to 1,494 meters)  
*Slope:* 0 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

### Taxonomic class

Fine-loamy, mixed, superactive, calcareous, mesic  
 Typic Torrifuvents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 10 minutes, 46.22 seconds north; longitude 111 degrees, 54 minutes, 47.72 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel, 2 percent cobbles, and 2 percent channers

A—0 to 4 inches; brown (10YR 4/3), fine sandy loam, pale brown (10YR 6/3), dry; 16 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common fine interstitial and tubular pores; 5 percent gravel, 2 percent cobbles, and 1 percent stones; strong effervescence; strongly alkaline, pH 8.5; clear smooth boundary.

C1—4 to 20 inches; brown (10YR 5/3), loam, very pale brown (10YR 7/3), dry; 23 percent clay; weak medium subangular blocky structure; friable, hard, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common fine tubular and few medium tubular pores; 5 percent gravel; strong effervescence; strongly alkaline, pH 8.6; abrupt wavy boundary.

C2—20 to 33 inches; brown (10YR 5/3), gravelly sandy loam, pink (7.5YR 7/3), dry; 16 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine interstitial and fine tubular pores; 25 percent gravel and 2 percent cobbles; strong effervescence; strongly alkaline, pH 8.7; abrupt wavy boundary.

Ab—33 to 37 inches; brown (10YR 4/3), sandy clay loam, pale brown (10YR 6/3), dry; 20 percent clay; moderate fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common fine and few medium tubular pores; slight effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

Cb1—37 to 46 inches; brown (10YR 5/3), loam, very pale brown (10YR 7/3), dry; 22 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common fine and few medium tubular pores; 2 percent gravel; strong effervescence; strongly alkaline, pH 8.6; clear smooth boundary.

Cb2—46 to 73 inches; brown (10YR 5/3), fine sandy loam, light gray (10YR 7/2), dry; 19 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium roots; many very fine interstitial and common very fine tubular pores; 5 percent gravel; strong effervescence; strongly alkaline, pH 8.7; clear smooth boundary.

Cb3—73 to 79 inches; grayish brown (10YR 5/2), fine sandy loam, light gray (10YR 7/2), dry; 15 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine roots; common very fine tubular pores; 10 percent gravel and 1 percent cobbles; strong effervescence; strongly alkaline, pH 8.7.

#### Range in Characteristics

*Surface fragments:* 0 to 10 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent channers

*Flooding:* rare in the months of July, August, and September

*Particle-size control section (weighted average):*  
*Clay content:* 18 to 27 percent

C and Cb horizons:

*Hue:* 7.5YR or 10YR

*Chroma:* 2 or 3 dry

*Texture:* loam, gravelly sandy loam, fine sandy loam

*Fragments:* 0 to 30 percent gravel, 0 to 5 percent cobbles

## Kenzo Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderately)

*Landform:* structural bench, escarpments on structural benches

*Parent material:* residuum, eolian sand

*Elevation:* 4,200 to 7,000 feet (1,281 to 2,134 meters)

*Slope:* 2 to 60 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 53 minutes, 53.00 seconds north; longitude 111 degrees, 19 minutes, 8.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 5 percent cobbles, and 3 percent stones

A—0 to 4 inches; yellowish red (5YR 4/6), cobbly loamy sand, reddish yellow (5YR 6/6), dry; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine and fine roots; common very fine tubular and few fine interstitial pores; 15 percent gravel and 10 percent cobbles; very slight effervescence; moderately alkaline, pH 8.1; clear smooth boundary.

C—4 to 11 inches; yellowish red (5YR 5/6), cobbly sandy loam, reddish yellow (5YR 6/6), dry; weak fine and medium granular structure; very friable, soft, nonsticky, nonplastic; few very fine and fine roots; common very fine tubular pores; 5 percent gravel, 15 percent cobbles, and 5 percent stones; slight effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

R—11 inches; Kayenta Formation sandstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 65 percent gravel, 0 to 25 percent cobbles, 5 to 15 percent channers, 0 to 15 percent stones, and 0 to 10 percent boulders

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent

A horizon:

*Hue:* 2.5YR to 7.5YR

*Value:* 4 to 6 dry; 4 or 5 moist

*Chroma:* 3 to 6; dry or moist

*Fragments:* 0 to 30 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent channers

C horizons:

*Hue:* 2.5YR to 7.5YR

*Value:* 4 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* fine sandy loam, sandy loam, loam, with appropriate modifiers

*Fragments:* 0 to 30 percent gravel, 10 to 20

percent cobbles, 0 to 5 percent channers, and 0 to 10 percent stones

## Kydestea Family

### Setting

*Depth class:* very shallow to shallow  
*Drainage class:* well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Landform:* ledge on escarpment  
*Parent material:* sandstone residuum and colluvium  
*Elevation:* 6,900 to 7,900 feet (2,104 to 2,409 meters)  
*Slope:* 50 to 80 percent

### Climatic data:

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)  
*Frost-free period:* 100 to 120 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, calcareous, mesic  
 Aridic Lithic Ustorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 15 minutes, 32.00 seconds north; longitude 111 degrees, 6 minutes, 13.00 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel, 5 percent cobbles, 15 percent stones, and 5 percent boulders

A—0 to 7 inches; brown (10YR 4/3), extremely stony loam, pale brown (10YR 6/3), dry; 22 percent clay; weak medium granular structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine roots; common very fine irregular pores; 10 percent gravel, 5 percent cobbles, 30 percent stones, and 15 percent boulders; very slight effervescence; slightly alkaline, pH 7.7; clear smooth boundary

C—7 to 19 inches; brown (7.5YR 4/3), extremely cobbly loam, strong brown (7.5YR 5/6), dry; 25 percent clay; moderate fine subangular blocky structure; friable, hard, moderately sticky, moderately plastic; few very fine and fine roots; few very fine irregular and fine tubular pores; 10 percent gravel, 30 percent cobbles, 15 percent stones, and 5 percent boulders; slight effervescence; slightly alkaline, pH 7.8; gradual wavy boundary.

R—19 inches; Straight Cliffs Formation sandstone bedrock

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 10 percent gravel, 0 to 10 percent cobbles, 10 to 20 percent stones, 0 to 10 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Fragments:* 5 to 15 percent gravel, 0 to 35 percent cobbles, 10 to 35 percent stones, and 0 to 20 percent boulders

C horizon:

*Clay content:* 18 to 27 percent

*Fragments:* 5 to 15 percent gravel, 25 to 35 percent cobbles, 10 to 20 percent stones, 0 to 10 percent boulders

## Lazear Series

### Setting

*Local phases:* warm, dry, steep  
*Depth class:* shallow  
*Drainage class:* well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Landform:* dissected hillslopes on structural benches, dissected structural benches  
*Parent material:* residuum  
*Elevation:* 4,700 to 6,800 feet (1,341 to 2,104 meters)  
*Slope:* 2 to 60 percent

### Climatic data:

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy, mixed, superactive, calcareous, mesic Lithic  
 Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 18 minutes, 27.47 seconds north; longitude 111 degrees, 53 minutes, 25.68 seconds west; datum: NAD 83

*Surface fragments:* 20 percent gravel, 5 percent cobbles, 10 percent channers, and 10 percent stones

A—0 to 4 inches; yellowish brown (10YR 5/4), very gravelly loam, pale brown (10YR 6/3), dry; 21 percent clay; weak fine granular structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine and medium roots; 25 percent gravel, 10 percent channers, and 5 percent flagstones; strong effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

C—4 to 11 inches; light olive brown (2.5Y 5/3), parachannery loam, pale yellow (2.5Y 7/3), dry; 26 percent clay; massive; friable, slightly hard, moderately sticky, moderately plastic; common very fine and few fine and medium roots; 10 percent parachanners and 5 percent channers; strong effervescence; strongly alkaline, pH 8.6; abrupt smooth boundary.

R—11 inches; Carmel Formation sandstone bedrock

#### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Surface fragments:* 10 to 70 percent gravel, 0 to 20 percent cobbles, 5 to 15 percent channers, and 5 to 15 percent stones

*Particle-size control section (weighted average):*  
*Clay content:* 18 to 35 percent

A horizons:

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry; 3 to 5 moist

*Chroma:* 2 to 6, dry or moist

*Fragments:* 5 to 25 percent gravel, 0 to 15 percent cobbles, 0 to 10 percent channers, 0 to 5 percent flagstones, and 0 to 5 percent stones

C horizon:

*Hue:* 7.5YR to 2.5Y

*Value:* 5 to 8 dry; 4 to 6 moist

*Chroma:* 3 or 4, dry or moist

*Texture:* gravelly clay loam, loam, gravelly sandy loam, parachannery loam

*Fragments:* 5 to 25 percent gravel and 10 to 25 percent channers

### Lemrac Series

#### Setting

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* small knolls on structural benches

*Parent material:* gypsum bedrock residuum

*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)

*Slope:* 2 to 60 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### Taxonomic class

Coarse-loamy, gypsic, mesic Ustic Torriorthents

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 33 minutes, 39.13 seconds north; longitude 111 degrees, 17 minutes, 43.66 seconds west; datum: NAD 83

A—0 to 1 inch; brown (7.5YR 4/4), loam, brown (7.5YR 5/4), dry; 15 percent clay; strong thin platy structure; friable, slightly hard, nonsticky, nonplastic; few very fine and fine roots; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

Cy1—1 to 19 inches; very pale brown (10YR 8/3), loam, white (10YR 8/1), dry; 15 percent clay; massive; friable, slightly hard, nonsticky, nonplastic; few very fine roots; 60 percent gypsum throughout horizon; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

Cy2—19 to 34 inches; very pale brown (10YR 8/3), loam, white (10YR 8/1), dry; 15 percent clay; massive; very friable, soft, nonsticky, nonplastic; 60 percent gypsum throughout horizon; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Cr—34 inches; Carmel Formation gypsum bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Particle-size control section (weighted average):*  
*Clay content:* 5 to 18 percent

A horizon:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6, dry or moist

Cy horizons:

*Hue:* 7.5YR or 10YR

*Value:* 6 to 8 dry; 5 to 8 moist

*Chroma:* 1 to 4

*Texture:* loam, parachannery sandy loam

*Effervescence:* slight to strong effervescence

*Reaction:* slightly to moderately alkaline

*Fragments:* 0 to 15 percent gravel, 5 to 15 percent  
parachanners  
*Gypsum content:* 40 to 80 percent

## Lithic Torriorthents

### Setting

*Depth class:* very shallow to shallow  
*Drainage class:* well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Landform:* ledges on escarpments  
*Parent material:* sandstone and shale residuum and  
colluvium  
*Elevation:* 4,300 to 5,600 feet (1,311 to 1,707 meters)  
*Slope:* 50 to 80 percent

### Climatic data:

*Mean annual precipitation:* 6 to 9 inches (152 to  
229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F.  
(11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

### Taxonomic class

Lithic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 12  
minutes, 51.00 seconds north; longitude 111  
degrees, 51 minutes, 16.00 seconds west; datum:  
NAD 83

*Surface fragments:* 10 percent gravel, 30 percent  
channers, 5 percent flagstones, and 5 percent  
boulders

A—0 to 1 inch; light yellowish brown (2.5Y 6/4), sandy  
loam, pale yellow (2.5Y 7/4), dry; 19 percent clay;  
moderate fine granular structure; 2 percent gravel;  
slight effervescence; moderately alkaline, pH 8.0.

C—1 to 9 inches; light yellowish brown (2.5Y 6/4), clay  
loam, pale yellow (2.5Y 7/4), dry; 28 percent clay;  
massive; slight effervescence; moderately  
alkaline, pH 8.0.

Cr—9 to 14 inches; weathered bedrock; moderately  
alkaline, pH 8.2.

R—14 inches; Straight Cliffs Formation sandstone.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock  
(lithic)

*Surface fragments:* 5 to 15 percent gravel, 25 to 35  
percent channers, 0 to 10 percent flagstones, and  
0 to 10 percent boulders

*Particle-size control section (weighted average):*  
*Clay content:* 27 to 35 percent

C horizon:

*Clay content:* 27 to 35 percent

## Mack Series

### Setting

*Local phase:* moist  
*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Landform:* fan remnant  
*Parent material:* mixed alluvium, eolian sand  
*Elevation:* 4,200 to 5,100 feet (1,280 to 1,555 meters)  
*Slope:* 1 to 8 percent

### Climatic data:

*Mean annual precipitation:* 6 to 9 inches (152 to  
229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F.  
(11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

### Taxonomic class

Fine-loamy, mixed, superactive, mesic Typic  
Calcicgids

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 28  
minutes, 54.00 seconds north; longitude 111  
degrees, 14 minutes, 58.00 seconds west; datum:  
NAD 83

A—0 to 6 inches; brown (7.5YR 4/4), loamy fine sand,  
brown (7.5YR 5/4), dry; 4 percent clay; weak  
medium platy parting to weak fine granular  
structure; very friable, soft, nonsticky, nonplastic;  
few very fine and fine roots; very slight  
effervescence; slightly alkaline, pH 7.8; clear  
smooth boundary.

AB—6 to 14 inches; reddish brown (5YR 4/4), fine  
sandy loam, reddish brown (5YR 5/4), dry; 11  
percent clay; weak fine and medium granular  
structure; very friable, soft, nonsticky, nonplastic;  
few very fine roots; few very fine and fine tubular  
pores; very slight effervescence; slightly alkaline,  
pH 7.8; clear wavy boundary.

Bt—14 to 25 inches; yellowish red (5YR 4/6), loam,  
yellowish red (5YR 5/6), dry; 21 percent clay; weak  
medium subangular blocky structure; friable, soft,  
slightly sticky, nonplastic; few very fine roots;  
common very fine and fine tubular pores; very

slight effervescence; moderately alkaline, pH 7.9; clear wavy boundary.

Bk1—25 to 40 inches; yellowish red (5YR 5/6), sandy loam, yellowish red (5YR 5/6), dry; 12 percent clay; moderate fine and medium subangular blocky structure; firm, slightly hard, nonsticky, nonplastic; few very fine roots; common very fine and fine tubular pores; 3 percent gravel; very slight effervescence; moderately alkaline, pH 8.0; gradual wavy boundary.

Bk2—40 to 60 inches; brown (7.5YR 5/4), sandy loam, light brown (7.5YR 6/4), dry; 9 percent clay; weak fine and medium subangular blocky structure; very firm, hard, nonsticky, nonplastic; 5 percent gravel; slight effervescence; moderately alkaline, pH 8.2.

#### Range in Characteristics

*Depth to diagnostic feature:* 4 to 14 inches to argillic horizon; 10 to 30 inches to secondary carbonates

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

A and AB horizons:

*Hue:* 5YR to 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6 moist

*Reaction:* slightly to moderately alkaline

Bt horizon:

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6, dry or moist

*Clay content:* 18 to 27 percent

*Reaction:* slightly to moderately alkaline

Bk horizons:

*Hue:* 5YR to 7.5YR

*Value:* 5 or 6, dry or moist

*Chroma:* 4 to 6, dry or moist

*Fragments:* 0 to 10 percent gravel

*Calcium carbonate equivalent:* 10 to 25 percent

*Reaction:* moderately to strongly alkaline

### Mellenthin Series

#### Setting

*Local phase:* moist

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* hillslope on structural bench

*Parent material:* residuum, colluvium

*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)

*Slope:* 2 to 60 percent

#### Climatic data:

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### Taxonomic class

Loamy-skeletal, mixed, superactive, mesic Lithic Ustic Haplocalcids

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 7 minutes, 57.00 seconds north; longitude 111 degrees, 58 minutes, 55.00 seconds west; datum: NAD 83

*Surface fragments:* 30 percent gravel, 20 percent cobbles, 25 percent channers, and 10 percent stones

A—0 to 4 inches; brown (7.5YR 4/4), extremely cobbly loam, light brown (7.5YR 6/4), dry; 20 percent clay; weak very fine and fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine and fine and few medium roots; common very fine irregular, vesicular and tubular pores; 25 percent gravel, 20 percent cobbles, 15 percent channers, and 5 percent stones; slight effervescence; slightly alkaline, pH 7.8; clear wavy boundary.

Bk—4 to 10 inches; strong brown (7.5YR 4/6), very cobbly loam; strong brown (7.5YR 5/6), dry; 22 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, moderately plastic; few very fine, fine, and medium roots; few very fine, fine tubular and very fine vesicular pores; 15 percent gravel, 20 percent cobbles, and 7 percent channers; moderately thick calcium carbonate coats on rock fragments; strong effervescence; moderately alkaline, pH 8.1; abrupt wavy boundary.

R—10 inches; Moenkopie Formation bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Depth to secondary carbonate:* 2 to 4 inches

*Surface fragments:* 5 to 60 percent gravel, 0 to 25 percent cobbles, 20 to 30 percent channers, and 5 to 15 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 10 to 30 percent gravel, 10

to 25 percent cobbles, 5 to 15 percent channers, and 0 to 10 percent stones

**A horizon:**

*Value:* 4 to 6 dry; 3 or 4 moist

*Chroma:* 4 to 6 dry; 3 or 4 moist

*Fragments:* 15 to 40 percent gravel, 15 to 25 percent cobbles, 10 to 20 percent channers, 0 to 15 percent stones, and 0 to 5 percent boulders

**Bk horizons:**

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6 dry or moist

*Texture:* very cobbly loam, extremely gravelly loam, extremely cobbly sandy loam

*Fragments:* 10 to 55 percent gravel, 10 to 25 percent cobbles, 5 to 15 percent channers, and 0 to 10 percent stones

*Calcium carbonate equivalent:* 5 to 30 percent

## Menefee Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* dissected structural bench, hillslopes, and ledges on escarpments

*Parent material:* residuum

*Elevation:* 5,600 to 7,900 feet (1,707 to 2,409 meters)

*Slope:* 2 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Loamy, mixed, active, calcareous, mesic, shallow  
Aridic Ustorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 32 minutes, 36.93 seconds north; longitude 111 degrees, 43 minutes, 56.22 seconds west; datum: NAD 83

*Surface fragments:* 25 percent gravel

A—0 to 3 inches; olive brown (2.5Y 4/3), loam, light olive brown (2.5Y 5/3), dry; 20 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; few very fine roots; few very fine vesicular pores; strong effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

C—3 to 10 inches; olive brown (2.5Y 4/3), loam, light olive brown (2.5Y 5/3), dry; 20 percent clay; massive; friable, slightly hard, slightly sticky, slightly plastic; few very fine, fine, and medium roots; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

Cr—10 inches; weathered Kaiparowits Formation bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 8 to 20 inches to bedrock (paralithic)

*Surface fragments:* 10 to 30 percent gravel, 5 to 15 percent cobbles, and 5 to 15 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 5 to 15 percent gravel

**A horizons:**

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 2 or 3 dry or moist

*Fragments:* 5 to 15 percent gravel and 0 to 5 percent cobbles

## Meriwhitica Series

### Setting

*Local phase:* moist

*Depth class:* very shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* hillslope on structural bench

*Parent material:* residuum

*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)

*Slope:* 5 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic  
Lithic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 49 minutes, 29.80 seconds north; longitude 111 degrees, 6 minutes, 42.40 seconds west; datum: NAD 83

*Surface fragments:* 70 percent gravel, 5 percent cobbles, and 5 percent channers

A—0 to 2 inches; light yellowish brown (10YR 6/4), gravelly loam, very pale brown (10YR 7/3), dry; 16 percent clay; strong very thick platy structure; friable, slightly hard, slightly sticky, slightly plastic; many very fine and fine and few medium vesicular and common very fine tubular pores; 14 percent gravel and 8 percent channers; strong effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

Bk—2 to 4 inches; yellowish brown (10YR 5/4), very gravelly loam, pale brown (10YR 6/3), dry; 17 percent clay; single grain; very friable, soft, slightly sticky, slightly plastic; common very fine roots; 38 percent carbonate masses around rock fragments; 40 percent gravel and 10 percent channers; violent effervescence; moderately alkaline, pH 8.2; abrupt wavy boundary.

R—4 inches; Moenkopi Formation Limestone bedrock

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 10 inches to bedrock (lithic)

*Surface fragments:* 50 to 80 percent gravel, 2 to 10 percent cobbles, and 2 to 15 percent channers

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent

Bk horizon:

*Fragments:* 20 to 60 percent gravel and 5 to 20 percent channers

*Calcium carbonate equivalent:* 15 to 30 percent

**Mespu Series****Setting**

*Depth class:* very deep

*Drainage class:* excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* sand sheet and dunes on structural benches

*Parent material:* eolian sand

*Elevation:* 4,800 to 6,700 feet (1,463 to 2,043 meters)

*Slope:* 0 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Siliceous, mesic Ustic Torripsamments

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 45 minutes, 22.05 seconds north; longitude 111 degrees, 26 minutes, 12.67 seconds west; datum: NAD 83

A—0 to 4 inches; brownish yellow (10YR 6/6), fine sand, pink (7.5YR 7/4), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine and fine roots; noneffervescent; neutral, pH 7.2; clear smooth boundary.

C1—4 to 41 inches; brownish yellow (10YR 6/6), fine sand, pink (7.5YR 7/4), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; noneffervescent; neutral, pH 7.2; gradual smooth boundary.

C2—41 to 60 inches; brownish yellow (10YR 6/6), fine sand, pink (7.5YR 7/4), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; noneffervescent; neutral, pH 7.2.

**Range in Characteristics**

*Particle-size control section (weighted average):*  
*Clay content:* 0 to 4 percent

A horizon:

*Hue:* 5YR or 7.5YR

*Value:* 4 to 7 dry; 3 to 6 moist

*Chroma:* 4 to 6, dry or moist

C horizons:

*Hue:* 5YR or 7.5YR

*Value:* 4 to 7 dry; 3 to 6 moist

*Chroma:* 4 to 6

**Mident Series****Setting**

*Depth class:* very shallow to shallow

*Drainage class:* somewhat excessively

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* hillslope on structural bench

*Parent material:* sandstone residuum, eolian sand

*Elevation:* 5,200 to 6,100 feet (1,585 to 1,859 meters)

*Slope:* 2 to 40 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Mixed, mesic shallow Ustic Torripsamments

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 39 minutes, 37.93 seconds north; longitude 111 degrees, 31 minutes, 31.35 seconds west; datum: NAD 83

A—0 to 3 inches; light yellowish brown (2.5Y 6/3), fine sand, pale yellow (2.5Y 7/3), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine and fine roots; 5 percent gravel; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

C—3 to 10 inches; light olive brown (2.5Y 5/3), fine sand, light yellowish brown (2.5Y 6/3), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine roots; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

Cr—10 inches; soft, highly-weathered Entrada sandstone.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Surface fragments:* trace amounts of gravel

*Particle-size control section (weighted average):*

*Clay content:* 1 to 5 percent

*Rock fragment content:* 0 to 15 percent gravel

A horizon:

*Fragments:* 0 to 10 percent gravel

C horizon:

*Clay content:* 1 to 5 percent

*Fragments:* 0 to 10 percent gravel

*Calcium carbonate equivalent:* 0 to 5 percent

Cr horizon:

*Depth to hard bedrock:* 20 to 30 inches

## Mido Series

### Setting

*Depth class:* very deep

*Drainage class:* excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* dune on structural bench

*Parent material:* eolian sand

*Elevation:* 4,200 to 6,700 feet (1,281 to 2,043 meters)

*Slope:* 2 to 40 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Mixed, mesic Ustic Torripsamments

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 35 minutes, 14.63 seconds north; longitude 111 degrees, 16 minutes, 26.59 seconds west; datum: NAD 83

A—0 to 3 inches; yellowish red (5YR 4/6), loamy fine sand, yellowish red (5YR 5/6), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine roots; noneffervescent; moderately alkaline, pH 8.0; clear smooth boundary.

C1—3 to 46 inches; yellowish red (5YR 4/6), loamy fine sand, yellowish red (5YR 5/8), dry; 4 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine and fine roots; slight effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

C2—46 to 60 inches; yellowish red (5YR 5/6), fine sand, reddish yellow (5YR 6/6), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; slight effervescence; moderately alkaline, pH 8.4.

**Range in Characteristics**

*Particle-size control section (weighted average):*

*Clay content:* 1 to 5 percent

A horizon:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist  
*Chroma:* 4 to 6

C horizons:

*Hue:* 5YR or 7.5YR  
*Value:* 5 to 7 dry and 4 to 6 moist  
*Chroma:* 4 to 8  
*Texture:* fine sand, loamy fine sand

## Mikim Series

### Setting

*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Landform:* alluvial flats on structural benches and stream terraces  
*Parent material:* alluvium  
*Elevation:* 5,700 to 6,500 feet (1,737 to 1,981 meters)  
*Slope:* 2 to 10 percent  
*Climatic data:*  
*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

### Taxonomic class

Fine-loamy, mixed, superactive, calcareous, mesic  
 Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 29 minutes, 58.80 seconds north; longitude 111 degrees, 57 minutes, 24.81 seconds west; datum: NAD 83

A—0 to 4 inches; brown (10YR 4/3), fine sandy loam, pale brown (10YR 6/3), dry; 12 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; many very fine interstitial and common very fine tubular pores; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

C1—4 to 7 inches; dark grayish brown (10YR 4/2), fine sandy loam, pale brown (10YR 6/3), dry; 16 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; many very fine

interstitial and tubular pores; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

C2—7 to 15 inches; olive (5Y 4/3), loam, pale olive (5Y 6/3), dry; 25 percent clay; weak fine and medium subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; common very fine and fine and few medium and coarse roots; common very fine and few fine tubular pores; strong effervescence; strongly alkaline, pH 8.6; abrupt smooth boundary.

C3—15 to 25 inches; light olive brown (2.5Y 5/3), very fine sandy loam, very pale brown (10YR 7/3), dry; 17 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine and medium roots; common very fine and fine tubular pores; strong effervescence; strongly alkaline, pH 8.5; clear smooth boundary.

C4—25 to 28 inches; dark grayish brown (2.5Y 4/2), loam, pale yellow (5Y 7/3), dry; 22 percent clay; weak fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine and medium roots; common very fine and fine tubular pores; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

C5—28 to 33 inches; brown (10YR 5/3), fine sandy loam, very pale brown (10YR 7/3), dry; 12 percent clay; weak fine subangular blocky structure; very friable, soft, slightly sticky, slightly plastic; common very fine and few fine and medium roots; common very fine interstitial and tubular pores; strong effervescence; moderately alkaline, pH 8.3; clear smooth boundary.

C6—33 to 42 inches; light olive brown (2.5Y 5/3), loam, light yellowish brown (2.5Y 6/3), dry; 22 percent clay; weak fine and medium subangular blocky structure; 22 percent gypsum masses on surfaces along pores; friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine roots; common very fine and few fine tubular and few very fine interstitial pores; few gypsum veins; strong effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

C7—42 to 63 inches; yellowish brown (10YR 5/4), fine sandy loam, very pale brown (10YR 7/4), dry; 8 percent clay; single grain; loose, loose, slightly sticky, slightly plastic; few very fine and fine roots; many very fine interstitial pores; very few gypsum veins; strong effervescence; moderately alkaline, pH 8.1.

**Range in Characteristics**

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

A horizon:

*Value:* 4 to 6 dry; 4 or 5 moist

*Chroma:* 3 or 4 dry or moist

C horizons:

*Hue:* 7.5YR to 5Y

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 3 or 4 dry; 2 to 4 moist

*Texture:* loam, fine sandy loam, very fine sandy loam, clay loam

*Calcium carbonate equivalent:* 1 to 10 percent

*Reaction:* slightly to strongly alkaline

**Milok Series****Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* alluvial flat or plain on structural bench

*Parent material:* eolian sand, mixed alluvium

*Elevation:* 4,600 to 6,200 feet (1,402 to 1,890 meters)

*Slope:* 1 to 10 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, mesic Ustic Haplocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 31 minutes, 17.17 seconds north; longitude 111 degrees, 20 minutes, 0.29 seconds west; datum: NAD 83

A—0 to 2 inches; strong brown (7.5YR 5/6), fine sandy loam, reddish yellow (7.5YR 6/6), dry; 8 percent clay; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; many very fine and few fine roots; very slight effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

Bw—2 to 8 inches; yellowish red (5YR 4/6), fine sandy loam, yellowish red (5YR 5/6), dry; 9 percent clay;

weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; many very fine and few fine roots; very slight effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

Bk1—8 to 23 inches; yellowish red (5YR 5/6), fine sandy loam, reddish yellow (5YR 6/6), dry; 9 percent clay; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; many very fine roots; carbonate masses and finely disseminated carbonate throughout; slight effervescence; strongly alkaline, pH 8.6; clear wavy boundary.

Bk2—23 to 38 inches; reddish yellow (5YR 6/6), sandy loam, reddish yellow (5YR 7/6), dry; 17 percent clay; massive; very friable, slightly hard, slightly sticky, slightly plastic; many very fine roots; krotovinas and finely disseminated carbonate throughout; strong effervescence; strongly alkaline, pH 8.6; clear wavy boundary.

Bk3—38 to 60 inches; reddish yellow (5YR 6/6), sandy loam, pink (5YR 8/4), dry; 17 percent clay; massive; very friable, slightly hard, slightly sticky, slightly plastic; few very fine roots; finely disseminated carbonate throughout; strong effervescence; strongly alkaline, pH 8.6.

**Range in Characteristics**

*Depth to diagnostic feature:* 6 to 20 inches to cambic horizon; 8 to 18 inches to secondary carbonates

*Surface fragments:* 0 to 5 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

A and AB horizon:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6 dry or moist

Bw and Bk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 to 8 dry; 4 to 6 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* fine sandy loam, sandy loam, loam

*Fragments:* 0 to 5 percent gravel

*Calcium carbonate equivalent:* 5 to 30 percent

**Minchey Series****Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* pediment, stream terrace remnants

*Parent material:* mixed alluvium

*Elevation:* 4,100 to 4,900 feet (1,250 to 1,494 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Fine-loamy, mixed, active, mesic Typic Haplocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 10 minutes, 11.18 seconds north; longitude 111 degrees, 45 minutes, 22.15 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel

A1—0 to 2 inches; brown (10YR 4/3), loamy fine sand, brown (10YR 5/3), dry; 5 percent clay; weak thin platy parting to weak fine granular structure; very friable, soft, nonsticky, nonplastic; many very fine and few fine roots; very slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

A2—2 to 6 inches; brown (10YR 5/3), fine sandy loam, pale brown (10YR 6/3), dry; 15 percent clay; moderate medium subangular blocky structure; very friable, slightly hard, slightly sticky, nonplastic; many very fine and few fine roots; very slight effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Bk1—6 to 24 inches; brown (7.5YR 5/3), sandy clay loam, light brown (7.5YR 6/3), dry; 20 percent clay; weak fine subangular blocky structure; friable, hard, slightly sticky, nonplastic; common very fine roots; common medium calcium carbonate masses; 10 percent gravel; strong effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

Bk2—24 to 40 inches; brown (10YR 5/3), gravelly sandy clay loam, pale brown (10YR 6/3), dry; 25 percent clay; weak medium and coarse subangular blocky structure; friable, hard, slightly sticky, nonplastic; few very fine roots; many medium calcium carbonate masses and carbonate coats between sand grains; 30 percent gravel; violent effervescence; strongly alkaline, pH 8.6; clear wavy boundary.

C1—40 to 49 inches; brown (7.5YR 5/3), very gravelly sandy loam, light brown (7.5YR 6/3), dry; 16 percent clay; massive; friable, slightly hard,

slightly sticky, nonplastic; few very fine roots; many carbonate coats between sand grains; 35 percent gravel; strong effervescence; strongly alkaline, pH 8.8; clear wavy boundary.

C2—49 to 60 inches; brown (10YR 5/3), sandy loam, pale brown (10YR 6/3), dry; 16 percent clay; massive; friable, hard, slightly sticky, nonplastic; 10 percent gravel; strong effervescence; strongly alkaline, pH 9.0.

**Range in Characteristics**

*Depth to diagnostic feature:* 10 to 30 inches to secondary carbonates

*Surface fragments:* 0 to 10 percent rounded gravel

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 0 to 15 percent rounded gravel

A horizons:

*Value:* 5 or 6 dry; 4 or 5 moist

*Texture:* fine sandy loam, loamy fine sand

Bk horizons:

*Hue:* 7.5YR or 10YR

*Texture:* sandy clay loam, gravelly sandy clay loam

*Fragments:* 5 to 35 percent gravel

*Calcium carbonate equivalent:* 15 to 30 percent

*Reaction:* moderately to strongly alkaline

C horizons:

*Hue:* 7.5YR or 10YR

*Texture:* very gravelly sandy loam, sandy loam

*Calcium carbonate equivalent:* 15 to 30 percent

*Fragments:* 10 to 35 percent gravel

**Mivida Series**

**Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* plain on structural bench

*Parent material:* eolian sand, mixed alluvium

*Elevation:* 4,400 to 6,100 feet (1,341 to 1,860 meters)

*Slope:* 1 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### **Taxonomic class**

Coarse-loamy, mixed, superactive, mesic Ustic  
Haplocalcids

#### **Typical Pedon**

*Location in survey area:* latitude 37 degrees, 38 minutes, 47.14 seconds north; longitude 111 degrees, 26 minutes, 55.41 seconds west; datum: NAD 83

A—0 to 2 inches; reddish brown (5YR 4/4), loamy fine sand, reddish brown (5YR 5/4), dry; 4 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine roots; slight effervescence; moderately alkaline, pH 7.9; clear smooth boundary.

Bw—2 to 36 inches; yellowish red (5YR 4/6), fine sandy loam, yellowish red (5YR 5/6), dry; 12 percent clay; weak to moderate fine subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; common very fine and fine roots; few very fine and fine pores; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

Bk—36 to 60 inches; reddish brown (5YR 5/3), fine sandy loam, light reddish brown (5YR 6/3), dry; 10 percent clay; weak to moderate fine subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; common very fine and fine roots; few very fine and fine pores; 35 percent carbonate coats on ped surfaces; strong effervescence; moderately alkaline, pH 8.3.

#### **Range in Characteristics**

*Depth to diagnostic feature:* 20 to 30 inches to secondary carbonates; 7 to 22 inches to cambic horizon

*Surface fragments:* 0 to 5 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

*Rock fragment content:* 0 to 15 percent gravel

A horizons:

*Hue:* 5YR or 7.5YR

*Value:* 3 or 4 moist

Bw and Bk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry, 4 or 5 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* fine sandy loam, sandy loam, loam

*Fragments:* 0 to 15 percent gravel

*Calcium carbonate equivalent:* 0 to 30 percent

## **Moclom Series**

#### **Setting**

*Depth class:* very shallow and shallow

*Drainage class:* somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* structural bench

*Parent material:* alluvium, residuum

*Elevation:* 5,200 to 6,200 feet (1,585 to 1,890 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### **Taxonomic class**

Mixed, mesic Lithic Torripsamments

#### **Typical Pedon**

*Location in survey area:* latitude 37 degrees, 46 minutes, 18.40 seconds north; longitude 111 degrees, 38 minutes, 0.83 seconds west; datum: NAD 83

*Surface fragments:* 45 percent rounded gravel

A—0 to 3 inches; yellowish brown (10YR 5/4), gravelly sand, light yellowish brown (10YR 6/4), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine and fine roots; 20 percent rounded gravel; noneffervescent; neutral, pH 7.0; clear smooth boundary.

C—3 to 10 inches; yellowish brown (10YR 5/4), sand, light yellowish brown (10YR 6/4), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine roots; 10 percent rounded gravel; noneffervescent; neutral, pH 7.2; abrupt smooth boundary.

R—10 inches; Morrison Formation conglomerate bedrock.

#### **Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 15 to 60 percent well rounded gravel

*Particle-size control section (weighted average):*

*Clay content:* 1 to 5 percent

*Rock fragment content:* 5 to 35 percent rounded gravel

## A horizon:

*Value:* 5 to 7 dry; 4 to 6 moist  
*Chroma:* 2 to 4

## C horizon:

*Value:* 5 to 7 dry; 4 to 6 moist  
*Chroma:* 2 to 4  
*Fragments:* 5 to 35 percent rounded gravel

**Moenkopie Series****Setting**

*Local phase:* warm  
*Depth class:* very shallow to shallow  
*Drainage class:* well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Landform:* hillslopes on structural benches  
*Parent material:* siltstone and sandstone residuum  
*Elevation:* 4,000 to 5,000 feet (1,220 to 1,524 meters)  
*Slope:* 10 to 30 percent  
*Climatic data:*  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

**Taxonomic class**

Loamy, mixed, superactive, calcareous, mesic Lithic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 29 minutes, 39.00 seconds north; longitude 111 degrees, 16 minutes, 28.00 seconds west; datum: NAD 83

*Surface fragments:* 3 percent gravel and 1 percent cobbles

A—0 to 6 inches; reddish brown (5YR 4/4), loamy fine sand, light reddish brown (5YR 6/4), dry; 5 percent clay; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; 5 percent gravel; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

C—6 to 12 inches; yellowish red (5YR 4/6), loamy sand, reddish yellow (5YR 6/6), dry; 6 percent clay; weak fine and medium granular structure; friable, soft, nonsticky, nonplastic; few very fine roots; common very fine pores; 3 percent gravel and 5 percent cobbles; slight effervescence;

moderately alkaline, pH 8.2; abrupt smooth boundary.

R—12 inches; Entrada sandstone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 20 percent gravel and 0 to 20 percent cobbles

*Calcium carbonate equivalent:* 5 to 15 percent

*Particle-size control section (weighted average):*

*Clay content:* 0 to 18 percent

*Rock fragment content:* 5 to 15 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent stones.

## A horizon:

*Hue:* 2.5YR to 5YR

*Value:* 4 to 6 dry; 3 or 4 moist

*Fragments:* 0 to 10 percent gravel and 0 to 10 percent cobbles

## C horizon:

*Hue:* 2.5YR to 5YR

*Value:* 4 or 5 moist

*Chroma:* 4 to 6, dry or moist

*Texture:* loamy sand, loam

*Fragments:* 5 to 15 percent gravel and 0 to 10 percent cobbles

**Moepitz Series****Setting**

*Depth class:* moderately deep  
*Drainage class:* well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Landform:* hillslopes on structural benches and breaks  
*Parent material:* mixed alluvium, eolian sand  
*Elevation:* 4,000 to 5,200 feet (1,220 to 1,585 meters)  
*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, calcareous, mesic Typic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 25 minutes, 52.00 seconds north; longitude 111

degrees, 11 minutes, 42.00 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel, 5 percent cobbles, 3 percent stones, and 2 percent boulders.

A—0 to 3 inches; reddish brown (5YR 4/4), loamy fine sand, light reddish brown (5YR 6/4), dry; 3 percent clay; weak fine platy parting to fine granular structure; loose, loose, nonsticky, nonplastic; few very fine and fine roots; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

AC—3 to 8 inches; yellowish red (5YR 4/6), loamy fine sand, reddish yellow (5YR 6/6), dry; 4 percent clay; weak medium granular structure; very friable, soft, nonsticky, nonplastic; few very fine roots; slight effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

C—8 to 28 inches; yellowish red (5YR 4/6), sandy loam, reddish yellow (5YR 6/6), dry; 8 percent clay; weak medium granular structure; very friable, soft, nonsticky, nonplastic; few very fine roots; slight effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

R—28 inches; Entrada Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Surface fragments:* 0 to 10 percent gravel, 0 to 10 percent cobbles, 0 to 5 percent stones, and 0 to 5 percent boulders

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent

A and AC horizons:

*Chroma:* 4 to 6, dry or moist

C horizon:

*Clay content:* 8 to 18 percent

### Moffat Series

#### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* plain on structural bench, alluvial fan remnants

*Parent material:* eolian sand, alluvium

*Elevation:* 3,500 to 5,200 feet (1,067 to 1,585 meters)

*Slope:* 1 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

#### Taxonomic class

Coarse-loamy, mixed, superactive, mesic Typic Haplocalcids

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 18 minutes, 4.00 seconds north; longitude 111 degrees, 3 minutes, 2.00 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel and 1 percent cobbles

A1—0 to 5 inches; reddish brown (5YR 4/4), loamy fine sand, reddish brown (5YR 5/4), dry; 4 percent clay; weak fine platy parting to weak fine granular structure; very friable, loose, nonsticky, nonplastic; few very fine roots; slight effervescence; moderately alkaline, pH 7.9; clear smooth boundary.

A2—5 to 19 inches; yellowish red (5YR 4/6), loamy fine sand, yellowish red (5YR 5/6), dry; 8 percent clay; weak medium granular structure; very friable, soft, nonsticky, nonplastic; few very fine roots; slight effervescence; moderately alkaline, pH 7.9; clear wavy boundary.

Bk1—19 to 35 inches; yellowish red (5YR 5/6), fine sandy loam, reddish yellow (5YR 6/6), dry; 10 percent clay; weak fine and medium subangular blocky structure; very friable, soft, nonsticky, nonplastic; few very fine roots; carbonates disseminated throughout; 2 percent gravel; strong effervescence; moderately alkaline, pH 7.9; abrupt smooth boundary.

Bk2—35 to 55 inches; reddish brown (5YR 5/4), fine sandy loam, light reddish brown (5YR 6/4), dry; 10 percent clay; weak fine subangular blocky structure; firm, slightly hard, nonsticky, slightly plastic; thin carbonate coats on rock fragments and carbonates in soft nodules; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

Bk3—55 to 60 inches; brown (7.5YR 5/4), fine sandy loam, light brown (7.5YR 6/4), dry; 9 percent clay;

massive; firm, slightly hard, nonsticky, slightly plastic; thin carbonate coats on rock fragments and carbonates in soft nodules; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.1.

#### Range in Characteristics

*Depth to diagnostic feature:* 3 to 20 inches to secondary carbonates

*Surface fragments:* 0 to 5 percent gravel and 0 to 5 percent cobbles

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

*Rock fragment content:* 0 to 10 percent gravel

A horizons:

*Chroma:* 4 to 6, dry or moist

Bw and Bk horizons:

*Hue:* 2.5YR to 7.5YR

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 3 to 6

*Texture:* sandy loam, fine sandy loam

*Fragments:* 0 to 15 percent gravel

*Calcium carbonate equivalent:* 5 to 25 percent

## Nakai Series

### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* sand sheet on structural bench

*Parent material:* eolian sand

*Elevation:* 4,000 to 5,000 feet (1,220 to 1,524 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

### Taxonomic class

Coarse-loamy, mixed, superactive, mesic Typic Haplocalcids

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 19 minutes, 12.34 seconds north; longitude 111 degrees, 2 minutes, 36.03 seconds west; datum: NAD 83

A—0 to 3 inches; reddish brown (5YR 4/4), sandy loam, yellowish red (5YR 5/6), dry; 14 percent

clay; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine and fine roots; common very fine and few fine tubular pores; very slight effervescence; slightly alkaline, pH 7.4; abrupt smooth boundary.

Bw1—3 to 10 inches; yellowish red (5YR 4/6), sandy loam, yellowish red (5YR 5/6), dry; 15 percent clay; weak fine and medium subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; common very fine and fine roots; few very fine and fine tubular pores; very slight effervescence; slightly alkaline, pH 7.4; clear smooth boundary.

Bw2—10 to 20 inches; yellowish red (5YR 4/6), fine sandy loam, yellowish red (5YR 5/6), dry; 17 percent clay; moderate fine and medium subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; common very fine and fine roots; few very fine and fine tubular pores; very slight effervescence; slightly alkaline, pH 7.6; abrupt smooth boundary.

Bk1—20 to 28 inches; light brown (7.5YR 6/4), sandy loam, pink (7.5YR 7/4), dry; 16 percent clay; weak fine and medium subangular blocky structure; friable, hard, nonsticky, nonplastic; common very fine and fine roots; few very fine tubular pores; carbonate coats on all faces of peds; strong effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

Bk2—28 to 42 inches; light brown (7.5YR 6/4), sandy loam, pink (7.5YR 8/4), dry; 16 percent clay; weak fine subangular blocky structure; friable, hard, nonsticky, nonplastic; few very fine and fine roots; few very fine tubular pores; carbonate coats on all faces of peds; strong effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

C—42 to 60 inches; light brown (7.5YR 6/4), sandy loam, pink (7.5YR 7/4), dry; 17 percent clay; massive; firm, hard, slightly sticky, slightly plastic; violent effervescence; moderately alkaline, pH 8.4.

### Range in Characteristics

*Depth to diagnostic feature:* 20 to 40 inches to secondary carbonates; 5 to 21 inches to cambic horizon

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

*Rock fragment content:* 0 to 5 percent gravel

A horizon:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6

Bw and Bk horizons:

*Hue:* 5YR or 7.5YR  
*Value:* 5 to 8 dry; 4 to 6 moist  
*Chroma:* 4 to 6, dry or moist  
*Texture:* sandy loam, loamy fine sand, fine sandy loam  
*Fragments:* 0 to 5 percent gravel  
*Calcium carbonate equivalent:* 5 to 30 percent

## Nalcase Series

### Setting

*Depth class:* very shallow and shallow  
*Drainage class:* somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Landform:* sand sheet and dunes on structural bench  
*Parent material:* eolian sand, alluvium and residuum  
*Elevation:* 4,800 to 7,500 feet (1,463 to 2,287 meters)  
*Slope:* 2 to 30 percent

### Climatic data:

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

### Taxonomic class

Siliceous, mesic Lithic Torripsamments

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 46 minutes, 3.53 seconds north; longitude 111 degrees, 25 minutes, 30.46 seconds west; datum: NAD 83

A—0 to 4 inches; yellowish brown (10YR 5/6), fine sand, very pale brown (10YR 7/4), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine and fine roots; noneffervescent; neutral, pH 7.0; clear smooth boundary.

C—4 to 8 inches; yellowish brown (10YR 5/4), fine sand, very pale brown (10YR 7/3), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine and few medium roots; noneffervescent; neutral, pH 7.2; abrupt smooth boundary.

R—8 inches; Navajo Formation sandstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 15 percent gravel  
*Particle-size control section (weighted average):*  
*Clay content:* 0 to 5 percent  
*Rock fragment content:* 0 to 5 percent gravel

### A horizon:

*Hue:* 7.5YR or 10YR  
*Value:* 5 to 7 dry, 4 to 6 moist  
*Chroma:* 3 to 6, dry or moist

### C horizon:

*Hue:* 5YR to 10YR  
*Value:* 5 to 7 moist, 5 to 7 dry  
*Chroma:* 3 to 6, dry or moist  
*Texture:* fine sand, sand, loamy sand, loamy fine sand  
*Fragments:* 5 to 20 percent gravel

## Navigon Series

### Setting

*Depth class:* very shallow to shallow  
*Drainage class:* somewhat excessively drained  
*Slowest permeability:* Greater than 20 in/hr (very rapid)  
*Landform:* scree slope on structural bench  
*Parent material:* eolian sand  
*Elevation:* 6,200 to 7,200 feet (1,890 to 2,195 meters)  
*Slope:* 30 to 60 percent

### Climatic data:

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

### Taxonomic class

Sandy-skeletal, siliceous, mesic Lithic Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 50 minutes, 52.40 seconds north; longitude 111 degrees, 36 minutes, 45.70 seconds west; datum: NAD 83

*Surface fragments:* 35 percent gravel, 20 percent cobbles, and 20 percent stones, lithology is basalt

A—0 to 4 inches; yellowish brown (10YR 5/4), extremely stony fine sand, light yellowish brown (10YR 6/4), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine and fine roots; 15 percent gravel, 25 percent cobbles, and

30 percent stones, lithology is basalt; noneffervescent; neutral, pH 7.0; clear smooth boundary.

C—4 to 8 inches; yellowish brown (10YR 5/4), very cobbly fine sand, light yellowish brown (10YR 6/4), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine and fine roots; 15 percent gravel, 30 percent cobbles, and 10 percent stones, lithology is basalt; noneffervescent; neutral, pH 7.0; abrupt smooth boundary.

R—8 inches; Navajo Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 30 to 40 percent gravel, 15 to 25 percent cobbles, and 15 to 25 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 0 to 8 percent

*Rock fragment content:* 35 to 70 percent basalt gravel, cobbles, and stones

C horizon:

*Clay content:* 0 to 8 percent

*Fragments:* Basalt with some sandstone fragments; 10 to 20 percent gravel, 25 to 35 percent cobbles, and 5 to 15 percent stones

### Needle Series

#### Setting

*Depth class:* very shallow to shallow

*Drainage class:* excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* sand sheet on structural bench

*Parent material:* mixed alluvium, eolian sand

*Elevation:* 4,000 to 5,000 feet (1,220 to 1,524 meters)

*Slope:* 8 to 35 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

#### Taxonomic class

Mixed, mesic Lithic Torripsamments

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 28 minutes, 13.00 seconds north; longitude 111

degrees, 12 minutes, 0.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 10 percent cobbles, and 5 percent stones.

A—0 to 5 inches; yellowish red (5YR 4/6), loamy fine sand, reddish brown (5YR 5/4), dry; weak fine platy parting to single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; 5 percent gravel; noneffervescent; moderately alkaline, pH 8.0; clear smooth boundary.

C—5 to 13 inches; yellowish red (5YR 5/6), loamy fine sand, reddish yellow (5YR 6/6), dry; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; very slight effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

R—13 inches; Entrada Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 15 percent gravel, 0 to 15 percent cobbles, and 0 to 10 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 1 to 5 percent

*Rock fragment content:* 0 to 5 percent gravel

A horizon:

*Value:* 5 or 6 dry

*Chroma:* 4 to 6

C horizons:

*Value:* 4 or 5 moist

*Chroma:* 4 to 6

### Nepalto Series

#### Setting

*Local phase:* moist

*Depth class:* very deep

*Drainage class:* somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* drainageway on structural bench

*Parent material:* mixed alluvium

*Elevation:* 4,200 to 4,600 feet (1,280 to 1,402 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 19 minutes, 12.00 seconds north; longitude 111 degrees, 5 minutes, 37.00 seconds west; datum: NAD 83

*Surface fragments:* 15 percent gravel, 10 percent cobbles, 5 percent stones, and 10 percent boulders

A—0 to 16 inches; yellowish red (5YR 4/6), very stony loamy sand, light reddish brown (5YR 6/4), dry; 8 percent clay; weak fine granular structure; loose, loose, nonsticky, nonplastic; few very fine and fine roots; many very fine irregular pores; 10 percent gravel, 10 percent cobbles, and 10 percent stones; very slight effervescence; moderately alkaline, pH 8.1; clear smooth boundary.

C1—16 to 34 inches; reddish brown (5YR 4/3), very stony sand, pinkish gray (5YR 6/2), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine and fine roots; many very fine irregular pores; 15 percent gravel, 15 percent cobbles, and 20 percent stones; slight effervescence; moderately alkaline, pH 8.3; abrupt smooth boundary.

C2—34 to 52 inches; reddish brown (5YR 5/3), extremely stony sand, light reddish brown (5YR 6/3), dry; 1 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine irregular pores; 25 percent gravel, 15 percent cobbles, and 30 percent stones; slight effervescence; moderately alkaline, pH 8.4; abrupt wavy boundary.

C3—52 to 60 inches; reddish gray (5YR 5/2), extremely stony sand, pinkish gray (5YR 6/2), dry; 1 percent clay; massive; firm, hard, nonsticky, nonplastic; many very fine irregular pores; 30 percent gravel, 25 percent cobbles, and 20 percent stones; slight effervescence; moderately alkaline, pH 8.4.

**Range in Characteristics**

*Surface fragments:* 10 to 20 percent gravel, 5 to 15 percent cobbles, 0 to 10 percent stones, and 5 to 15 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 0 to 8 percent

*Rock fragment content:* 30 to 60 percent gravel, cobbles, and stones

C horizons:

*Hue:* 4 or 5, moist

*Chroma:* 2 to 4

*Texture:* very stony sand, extremely stony sand

*Clay content:* 0 to 8 percent

*Fragments:* 10 to 35 percent gravel, 10 to 30 percent cobbles, and 15 to 35 percent stones

**Nomrah Series**

**Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* remnant stream terrace

*Parent material:* alluvium

*Elevation:* 6,000 to 7,000 feet (1,829 to 2,134 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Calcic Haplustalfs

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 29 minutes, 32.50 seconds north; longitude 112 degrees, 6 minutes, 2.82 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel

A—0 to 3 inches; brown (7.5YR 4/3), loam, light brown (7.5YR 6/3), dry; 18 percent clay; weak fine granular structure; 5 percent gravel; noneffervescent; slightly alkaline, pH 7.8.

Bw—3 to 6 inches; brown (7.5YR 4/3), loam, light brown (7.5YR 6/4), dry; 19 percent clay; weak medium and weak thin platy structure; 2 percent gravel; noneffervescent; moderately alkaline, pH 8.0.

Bt—6 to 11 inches; brown (7.5YR 4/4), loam, light brown (7.5YR 6/4), dry; 25 percent clay; moderate medium subangular blocky structure; common thin and medium thick clay films on ped faces and on pore linings; 2 percent gravel; noneffervescent; moderately alkaline, pH 8.0.

Btk1—11 to 18 inches; brown (7.5YR 4/4), loam, light

brown (7.5YR 6/4), dry; 27 percent clay; moderate medium subangular blocky structure; common thin and medium thick clay films on ped faces and on pore linings; common carbonate veins along ped faces; 2 percent gravel; slight effervescence; moderately alkaline, pH 8.2.

Btk2—18 to 36 inches; yellowish red (5YR 4/6), loam, light reddish brown (5YR 6/4), dry; 26 percent clay; moderate medium subangular blocky structure; many thin and medium thick clay films on ped faces and on pore linings; many carbonate veins along ped faces; slight effervescence; moderately alkaline, pH 8.3.

Bk1—36 to 47 inches; strong brown (7.5YR 4/6), gravelly loam, reddish yellow (7.5YR 6/6), dry; 21 percent clay; weak fine and medium subangular blocky structure; many carbonate veins along ped faces and thin carbonate coats on rock fragments; 15 percent gravel; strong effervescence; moderately alkaline, pH 8.3.

Bk2—47 to 63 inches; strong brown (7.5YR 4/6), gravelly fine sandy loam, reddish yellow (7.5YR 6/6), dry; 17 percent clay; weak fine subangular blocky structure; many carbonate veins along ped faces and thin carbonate coats on rock fragments; 15 percent gravel; violent effervescence; moderately alkaline, pH 8.4.

#### Range in Characteristics

*Depth to secondary carbonates:* 10 to 20 inches

*Surface fragments:* 0 to 10 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 20 to 27 percent

Bw and Bt horizons:

*Value:* 4 to 6 dry

*Chroma:* 3 or 4, dry or moist

*Clay content:* 18 to 27 percent

*Fragments:* 0 to 5 percent gravel

Btk and Bk horizons:

*Hue:* 5YR or 7.5YR

*Chroma:* 4 to 6 moist

*Clay content:* 18 to 27 percent

*Fragments:* 0 to 20 percent gravel

*Calcium carbonate equivalent:* 15 to 30 percent

## Nonip Series

### Setting

*Local phase:* dry

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* dissected structural benches, hillslopes on structural benches

*Parent material:* siltstone, limestone, and shale residuum

*Elevation:* 5,000 to 6,900 feet (1,524 to 2,104 meters)

*Slope:* 5 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 41 minutes, 44.41 seconds north; longitude 111 degrees, 30 minutes, 1.94 seconds west; datum: NAD 83

*Surface fragments:* 80 percent channers

A—0 to 1 inch; brown (10YR 5/3), very channery loam, light yellowish brown (10YR 6/4), dry; 20 percent clay; weak medium platy parting to weak fine granular structure; very friable, soft, slightly sticky, nonplastic; few very fine and fine roots; common very fine and fine dendritic tubular pores; 50 percent channers; strong effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

C—1 to 5 inches; yellowish brown (10YR 5/4), very channery loam, light yellowish brown (10YR 6/4), dry; 25 percent clay; weak fine subangular blocky structure; very friable, soft, slightly sticky, slightly plastic; common very fine and fine roots; common very fine and few fine dendritic tubular pores; 50 percent channers; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

R—5 inches; Carmel Formation interbedded shale and siltstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 20 percent gravel, 40 to 90 percent channers, and 0 to 30 percent flagstones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 35 to 60 percent, dominantly channers

## A horizons:

*Hue:* 7.5YR or 10YR  
*Value:* 4 to 7 dry or moist  
*Chroma:* 2 to 6, dry or moist  
*Fragments:* 20 to 50 percent channers

## C horizon:

*Hue:* 7.5YR or 10YR  
*Value:* 4 to 7, dry or moist  
*Chroma:* 2 to 6, dry or moist  
*Texture:* silt loam, loam, clay loam, clay, with appropriate modifiers  
*Fragments:* 5 to 15 percent gravel and 35 to 80 percent channers  
*Calcium carbonate equivalent:* 15 to 30 percent

**Pagina Series****Setting**

*Depth class:* moderately deep  
*Drainage class:* somewhat excessively drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Landform:* low hill on structural bench  
*Parent material:* eolian sand, mixed alluvium  
*Elevation:* 3,500 to 4,800 feet (1,067 to 1,463 meters)  
*Slope:* 2 to 15 percent  
*Climatic data:*  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, mesic Typic Haplocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 13 minutes, 3.00 seconds north; longitude 111 degrees, 12 minutes, 26.00 seconds west; datum: NAD 83

A—0 to 6 inches; reddish brown (5YR 4/4), loamy fine sand, reddish brown (5YR 5/4), dry; 8 percent clay; single grain; very friable, soft, nonsticky, nonplastic; common very fine roots; noneffervescent; moderately alkaline, pH 8.0; clear smooth boundary.

Bw—6 to 17 inches; reddish brown (5YR 5/4), fine sandy loam, light reddish brown (5YR 6/4), dry; 12 percent clay; weak coarse subangular blocky structure; very friable, slightly hard, nonsticky,

nonplastic; common very fine and few fine roots; slight effervescence; moderately alkaline, pH 8.0; gradual wavy boundary.

Bk—17 to 35 inches; reddish brown (5YR 5/4), fine sandy loam, light reddish brown (5YR 6/4), dry; 12 percent clay; weak coarse subangular blocky structure; very friable, slightly hard, nonsticky, nonplastic; common very fine roots; carbonate coats on surfaces along root channels; 5 percent gravel; slight effervescence; moderately alkaline, pH 8.2; gradual wavy boundary.

Cr—35 to 57 inches; weathered Entrada Formation sandstone bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Depth to diagnostic feature:* 2 to 25 inches to secondary carbonates

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent

## A horizon:

*Fragments:* 0 to 15 percent gravel

## Bw horizon:

*Value:* 4 to 6 dry  
*Chroma:* 3 or 4, dry or moist  
*Clay content:* 18 to 27 percent  
*Texture:* sandy loam, fine sandy loam  
*Fragments:* 0 to 15 percent gravel

## Bk horizon:

*Texture:* sandy loam, loamy sand, fine sandy loam  
*Fragments:* 0 to 20 percent gravel  
*Calcium carbonate equivalent:* 15 to 30 percent  
*Reaction:* moderately to strongly alkaline

**Pariette Family****Setting**

*Depth class:* moderately deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Landform:* structural bench  
*Parent material:* alluvium, residuum  
*Elevation:* 4,370 to 5,000 feet (1,332 to 1,524 meters)  
*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Typic Haplocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 8 minutes, 18.20 seconds north; longitude 111 degrees, 50 minutes, 8.47 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel

A—0 to 3 inches; dark yellowish brown (10YR 4/4), fine sandy loam, light yellowish brown (10YR 6/4), dry; 12 percent clay; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; many very fine and fine roots; slight effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

Bw—3 to 9 inches; yellowish brown (10YR 5/4), loam, yellowish brown (10YR 5/6), dry; 23 percent clay; weak medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; many very fine and fine roots; slight effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

Bk1—9 to 15 inches; light yellowish brown (10YR 6/4), loam, very pale brown (10YR 7/3), dry; 24 percent clay; massive; friable, hard, slightly sticky, slightly plastic; many very fine and few fine roots; carbonates are disseminated and segregated in soft masses and veins; 5 percent gravel; strong effervescence; strongly alkaline, pH 8.8; clear smooth boundary.

Bk2—15 to 29 inches; light yellowish brown (10YR 6/4), loam, very pale brown (10YR 7/3), dry; 26 percent clay; massive; firm, hard, slightly sticky, slightly plastic; common very fine roots; carbonates are disseminated and segregated in soft masses and veins; 10 percent gravel; strong effervescence; strongly alkaline, pH 8.8; clear wavy boundary.

Bk3—29 to 38 inches; light yellowish brown (10YR 6/4), very gravelly loam, very pale brown (10YR 7/3), dry; 26 percent clay; massive; firm, hard, slightly sticky, slightly plastic; few very fine roots; carbonates are disseminated and segregated in soft masses and veins; 40 percent gravel and 5 percent cobbles; strong effervescence; strongly alkaline, pH 8.8; abrupt wavy boundary.

Cr—38 inches; weathered Dakota Formation bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Depth to diagnostic feature:* 8 to 10 inches to secondary carbonates; 2 to 5 inches to cambic horizon

*Surface fragments:* 0 to 10 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 10 to 30 percent gravel and cobbles

Bk horizons:

*Fragments:* 0 to 35 percent gravel, 0 to 10 percent cobbles

*Calcium carbonate equivalent:* 15 to 30 percent

**Parkelei Series**

**Setting**

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* structural benches, remnant stream terraces, fan remnants

*Parent material:* eolian sand and sandstone alluvium

*Elevation:* 5,550 to 7,260 feet (1,692 to 2,212 meters)

*Slope:* 2 to 10 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (229 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 15 minutes, 4.93 seconds north; longitude 112 degrees, 19 minutes, 58.18 seconds west; datum: NAD 83

A—0 to 3 inches; dark brown (7.5YR 3/4), fine sandy loam, brown (7.5YR 4/4), dry; 11 percent clay; weak thick platy structure; very friable, soft, nonsticky, nonplastic; common very fine and fine and few medium roots; many very fine vesicular

pores; noneffervescent; neutral, pH 7.0; clear smooth boundary.

Bw—3 to 7 inches; dark brown (7.5YR 3/4), fine sandy loam, brown (7.5YR 4/4), dry; 13 percent clay; weak fine subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; common very fine and fine and few medium roots; common very fine and fine tubular pores; noneffervescent; neutral, pH 7.2; clear wavy boundary.

Bt1—7 to 13 inches; yellowish red (5YR 4/6), sandy clay loam, yellowish red (5YR 5/8), dry; 23 percent clay; moderate fine and medium subangular blocky structure; very firm, hard, slightly sticky, slightly plastic; common fine and few very fine and medium roots; common very fine and fine tubular pores; common clay films on all faces of peds; noneffervescent; neutral, pH 7.3; gradual smooth boundary.

Bt2—13 to 30 inches; yellowish red (5YR 4/6), sandy clay loam, yellowish red (5YR 5/8), dry; 26 percent clay; moderate fine and medium subangular blocky structure; very firm, hard, slightly sticky, slightly plastic; few very fine and common fine roots; common fine tubular pores; many clay films on all faces of peds; noneffervescent; slightly alkaline, pH 7.4; clear wavy boundary.

Btk1—30 to 34 inches; yellowish red (5YR 4/6), clay loam, yellowish red (5YR 5/8), dry; 28 percent clay; moderate fine and medium subangular blocky structure; very firm, hard, moderately sticky, slightly plastic; common very fine tubular pores; common clay films on all faces of peds; 38 percent very fine and fine carbonate masses; slight effervescence; slightly alkaline, pH 7.8; gradual wavy boundary.

Btk2—34 to 44 inches; yellowish red (5YR 4/6), loam, yellowish red (5YR 5/6), dry; 27 percent clay; moderate fine subangular blocky structure; firm, moderately hard, moderately sticky, slightly plastic; common very fine interstitial pores; common clay films on all faces of peds and on surfaces along root channels; 38 percent fine carbonate masses; strong effervescence; moderately alkaline, pH 8.0; gradual wavy boundary.

Bk—44 to 61 inches; brown (7.5YR 5/4), loam, light brown (7.5YR 6/4), dry; 22 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine interstitial pores; 38 percent fine carbonate masses; strong effervescence; moderately alkaline, pH 8.0.

### Range in Characteristics

*Depth to diagnostic feature:* 28 to 32 inches to secondary carbonates; 5 to 10 inches to argillic horizon; 2 to 4 inches to cambic horizon

*Surface fragments:* 0 to 10 percent gravel and 0 to 5 percent cobbles

*Particle-size control section (weighted average):*

*Clay content:* 20 to 35 percent

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 4 or 5 dry; 3 or 4 moist

Bt horizons:

*Value:* 4 or 5 moist

*Texture:* sandy clay loam, loam

*Clay content:* 20 to 35 percent

Btk and Bk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 8, dry or moist

*Texture:* sandy clay loam, clay loam, loam

*Clay content:* 20 to 35 percent

*Calcium carbonate equivalent:* 2 to 10 percent

### Parkwash Series

#### Setting

*Depth class:* very shallow to shallow

*Drainage class:* somewhat excessively drained

*Slowest permeability:* greater than 20 in/hr (very rapid)

*Landform:* blowout areas, sand sheets and dunes on structural benches and climbing dunes

*Parent material:* eolian sand, residuum

*Elevation:* 5,250 to 7,870 feet (1,600 to 2,400 meters)

*Slope:* 2 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

#### Taxonomic class

Mesic, coated Lithic Quartzipsamments

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 18 minutes, 53.87 seconds north; longitude 112 degrees, 6 minutes, 4.51 seconds west; datum: NAD 83

Surface fragments: 10 percent gravel, 5 percent cobbles, and 2 percent stones

A—0 to 2 inches; yellowish brown (10YR 5/4), loamy fine sand, very pale brown (10YR 7/4), dry; 6 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and few fine roots; common very fine interstitial pores; 5 percent cobbles; noneffervescent; moderately alkaline, pH 8.0; clear smooth boundary.

C1—2 to 10 inches; yellowish brown (10YR 5/6), fine sand, very pale brown (10YR 7/4), dry; 4 percent clay; massive; soft, very friable, nonsticky, nonplastic; common very fine and fine roots; common very fine interstitial pores; noneffervescent; moderately alkaline, pH 8.0; clear smooth boundary.

C2—10 to 19 inches; light yellowish brown (10YR 6/4), fine sand, very pale brown (10YR 7/3), dry; 3 percent clay; massive; soft, very friable, nonsticky, nonplastic; few very fine and fine roots; common very fine interstitial pores; noneffervescent; moderately alkaline, pH 8.0; abrupt wavy boundary.

R—19 inches; Navajo Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Particle-size control section (weighted average):*  
*Clay content:* 1 to 5 percent

A horizon:

*Hue:* 5YR to 10YR

*Value:* 4 to 8 dry; 4 to 6 moist

*Chroma:* 3 to 6, dry or moist

C horizons:

*Hue:* 5YR to 10YR

*Value:* 4 to 7 dry; 3 to 6 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* loamy fine sand, fine sand

## Peekaboo Series

### Setting

*Depth class:* moderately deep

*Drainage class:* excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* dune on structural bench

*Parent material:* eolian sand, sandstone residuum

*Elevation:* 3,800 to 5,200 feet (1,159 to 1,585 meters)

*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

### Taxonomic class

Siliceous, mesic Typic Torripsamments

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 28 minutes, 2.00 seconds north; longitude 111 degrees, 10 minutes, 43.00 seconds west; datum: NAD 83

Surface fragments: 2 percent gravel

A—0 to 3 inches; reddish brown (5YR 4/4), loamy fine sand, light reddish brown (5YR 6/4), dry; 5 percent clay; weak fine platy parting to single grain; very friable, soft, nonsticky, nonplastic; common very fine and few fine roots; many very fine interstitial pores; noneffervescent; neutral, pH 7.0; clear smooth boundary.

C—3 to 22 inches; yellowish red (5YR 4/6), loamy fine sand, reddish yellow (5YR 6/6), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine and fine roots; many very fine interstitial pores; noneffervescent; neutral, pH 7.0; abrupt smooth boundary.

R—22 inches; Navajo Formation sandstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Surface fragments:* 0 to 5 percent gravel

*Particle-size control section (weighted average):*  
*Clay content:* 1 to 5 percent

A horizon:

*Hue:* 5YR to 10YR

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 3 to 6

C horizons:

*Hue:* 5YR to 10YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 6

*Texture:* fine sand or loamy fine sand

## Pinepoint Series

### Setting

*Local phase:* dry

*Depth class:* moderately to very deep

*Drainage class:* somewhat excessively drained

*Slowest permeability:* greater than 20 in/hr (very rapid)

*Landform:* alluvial flat, sand sheets on structural benches, climbing dune, and drainageways

*Parent material:* eolian sand

*Elevation:* 5,250 to 7,870 feet (1,600 to 2,400 meters)

*Slope:* 2 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Mesic, coated Ustic Quartzipsamments

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 10 minutes, 27.21 seconds north; longitude 112 degrees, 21 minutes, 16.71 seconds west; datum: NAD 83

A—0 to 6 inches; brown (10YR 4/3), fine sand, pale brown (10YR 6/3), dry; 5 percent clay; single grain and weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; common very fine and fine and few medium roots; noneffervescent; neutral, pH 6.8; gradual wavy boundary.

C1—6 to 15 inches; yellowish brown (10YR 5/4), fine sand, pale brown (10YR 6/3), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; common fine and medium roots; noneffervescent; neutral, pH 6.8; gradual wavy boundary.

C2—15 to 60 inches; yellowish brown (10YR 5/4), fine sand, very pale brown (10YR 7/3), dry; 1 percent clay; single grain; loose, loose, nonsticky, nonplastic; common fine and medium roots; noneffervescent; slightly alkaline, pH 7.4.

### Range in Characteristics

*Depth to restrictive feature:* 20 to greater than 60 inches to bedrock (lithic)

*Particle-size control section (weighted average):*  
*Clay content:* 1 to 5 percent

A horizon:

*Hue:* 5YR to 10YR

*Value:* 5 to 7 dry, 4 to 6 moist

*Chroma:* 2 to 6, dry or moist

C horizons:

*Hue:* 7.5YR or 10YR

*Value:* 4 to 7 dry, 3 to 6 moist

*Chroma:* 2 to 6

*Texture:* loamy fine sand, fine sand

## Plumasano Series

### Setting

*Local phase:* moist

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* structural bench

*Parent material:* eolian sand, slope alluvium

*Elevation:* 5,550 to 7,100 feet (1,692 to 2,165 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Coarse-loamy, mixed, superactive, mesic Aridic Haplustepts

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 28 minutes, 0.79 seconds north; longitude 111 degrees, 59 minutes, 52.01 seconds west; datum: NAD 83

A—0 to 4 inches; dark yellowish brown (10YR 4/4), loamy fine sand, light yellowish brown (10YR 6/4), dry; 6 percent clay; weak fine subangular blocky structure; noneffervescent; neutral, pH 7.0; clear smooth boundary.

Bw—4 to 19 inches; brown (7.5YR 4/4), fine sandy loam, brown (7.5YR 5/4), dry; 11 percent clay; weak medium subangular blocky parting to weak fine subangular blocky structure; noneffervescent; neutral, pH 7.2; clear smooth boundary.

C1—19 to 43 inches; dark yellowish brown (10YR 4/6), loamy fine sand, yellowish brown (10YR 5/6), dry; 7 percent clay; massive; noneffervescent; neutral, pH 7.2; clear smooth boundary.

C2—43 to 61 inches; dark yellowish brown (10YR 4/6),

fine sand, brownish yellow (10YR 5/6), dry; 4 percent clay; massive; noneffervescent; neutral, pH 7.2.

#### Range in Characteristics

*Depth to diagnostic feature:* 2 to 5 inches to cambic horizon

*Particle-size control section (weighted average):*  
*Clay content:* 5 to 18 percent

C horizons:

*Value:* 5 or 6 dry; 4 or 5 moist

*Texture:* loamy fine sand, fine sand

### Podo Series

#### Setting

*Depth class:* shallow

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* structural benches, ledges on escarpments

*Parent material:* colluvium, residuum

*Elevation:* 6,500 to 7,800 feet (1,982 to 2,378 meters)

*Slope:* 15 to 70 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

#### Taxonomic class

Loamy, mixed, superactive, frigid Aridic Lithic Haplustepts

#### Typical Pedon

*Location in survey area:* latitude: 37 degrees, 36 minutes, 36.81 seconds north; longitude 111 degrees, 54 minutes, 3.43 seconds west; datum: NAD 83

*Surface fragments:* 30 percent channers

A—0 to 4 inches; brown (10YR 4/3), channery sandy loam, brown (10YR 5/3), dry; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine and medium roots and common fine roots; many very fine interstitial pores; 10 percent gravel; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

C—4 to 17 inches; dark yellowish brown (10YR 4/4), sandy loam, brown (10YR 5/3), dry; massive;

nonsticky, nonplastic; few fine, medium, and coarse roots; strong effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

R—17 inches; Straight Cliffs Formation Sandstone bedrock

#### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Surface fragments:* 5 to 15 percent gravel, 0 to 5 percent cobbles, and 25 to 35 percent channers

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent

*Rock fragment content:* less than 35 percent; gravel, cobbles, channers, and stones

A horizon:

*Hue:* 7.5YR or 10 YR

*Value:* 5 to 7 dry; 3 to 5 moist

*Chroma:* 2 to 4, dry or moist

*Fragments:* 0 to 10 percent gravel

C horizon:

*Hue:* 5YR to 10YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 2 to 4, dry or moist

*Texture:* sandy loam, loam

*Clay content:* 8 to 18 percent

*Fragments:* 0 to 15 percent gravel

*Calcium carbonate equivalent:* 10 to 30 percent

### Polychrome Family

#### Setting

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* escarpment on structural bench

*Parent material:* slope alluvium, colluvium

*Elevation:* 5,500 to 6,500 feet (1,677 to 1,982 meters)

*Slope:* 15 to 60 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### Taxonomic class

Loamy-skeletal, mixed, superactive, calcareous, mesic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 54 minutes, 28.63 seconds north; longitude 111 degrees, 15 minutes, 7.00 seconds west; datum: NAD 83

*Surface fragments:* 15 percent gravel, 15 percent cobbles, 5 percent channers, 30 percent stones, and 15 percent boulders

A—0 to 18 inches; brown (7.5YR 4/3), extremely stony very fine sand, brown (7.5YR 5/3), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine and fine and common medium roots; 10 percent gravel, 15 percent cobbles, and 35 percent stones; noneffervescent; moderately alkaline, pH 8.0; clear irregular boundary.

C—18 to 31 inches; reddish brown (5YR 5/4), extremely cobbly fine sandy loam, pink (7.5YR 7/4), dry; 18 percent clay; massive; friable, slightly hard, nonsticky, nonplastic; common very fine, fine, medium, and coarse roots; 45 percent gravel, 40 percent cobbles, and 5 percent stones; slight effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

Cr—31 inches; weathered Chinle Formation shale bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Surface fragments:* 10 to 20 percent gravel, 10 to 20 percent cobbles, 0 to 10 percent channers, 15 to 35 percent stones, and 10 to 20 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 10 to 20 percent

*Rock fragment content:* 40 to 90 percent gravel, cobbles, and stones

C horizon:

*Hue:* 5YR, 7.5YR

*Fragments:* 15 to 45 percent gravel, 15 to 45 percent cobbles, and 0 to 30 percent stones

**Progresso Series****Setting**

*Local phases:* dry, cool

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* alluvial flat, structural bench

*Parent material:* alluvium

*Elevation:* 5,000 to 6,600 feet (1,524 to 2,012 meters)

*Slope:* 1 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Fine-loamy, mixed, superactive, mesic Ustic Calciargids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 12 minutes, 35.70 seconds north; longitude 111 degrees, 53 minutes, 36.20 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel

A—0 to 2 inches; brown (7.5YR 4/4), sandy loam, brown (7.5YR 5/4), dry; 15 percent clay; moderate medium platy parting to moderate fine granular structure; noneffervescent; slightly alkaline, pH 7.8.

Bt—2 to 12 inches; brown (7.5YR 4/4), sandy clay loam, brown (7.5YR 5/4), dry; 25 percent clay; moderate medium subangular blocky structure; clay films on all faces of peds; noneffervescent; slightly alkaline, pH 7.8.

Btk—12 to 16 inches; strong brown (7.5YR 4/6), sandy clay loam, strong brown (7.5YR 5/6), dry; 28 percent clay; moderate medium subangular blocky structure; clay films on all faces of peds; carbonate coats on nodules and surfaces along root channels; slight effervescence; moderately alkaline, pH 8.0.

Bk—16 to 22 inches; strong brown (7.5YR 5/6), loam, reddish yellow (7.5YR 6/6), dry; 24 percent clay; massive; carbonate coats on nodules; violent effervescence; moderately alkaline, pH 8.3.

R—22 inches; bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Depth to diagnostic feature:* 2 to 5 inches to argillic horizon; 10 to 14 inches to secondary carbonates

*Surface fragments:* 0 to 25 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 0 to 15 percent gravel

## A horizons:

*Value:* 5 or 6 dry  
*Chroma:* 3 or 4

## Bt and Btk horizons:

*Value:* 5 or 6 dry; 4 to 6 moist  
*Clay content:* 18 to 35 percent  
*Fragments:* 0 to 15 percent gravel

## Bk horizons:

*Value:* 5 or 6 dry; 4 or 5 moist  
*Texture:* sandy clay loam, loam  
*Fragments:* 0 to 15 percent gravel  
*Calcium carbonate equivalent:* 15 to 30 percent

## C horizon (when present):

*Value:* 6 or 7 dry; 5 or 6 moist  
*Chroma:* 3 or 4, dry or moist  
*Fragments:* 0 to 15 percent gravel

**Quagmeier Series****Setting**

*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Landform:* fan remnant, remnant stream terrace  
*Parent material:* sandstone and limestone alluvium  
*Elevation:* 6,660 to 7,260 feet (2,030 to 2,212 meters)  
*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F.  
(7.0 to 10.5 degrees C.)  
*Frost-free period:* 100 to 120 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, mesic Calcic  
Haplustalfs

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 23 minutes, 55.71 seconds north; longitude 112 degrees, 13 minutes, 54.47 seconds west; datum: NAD 83

*Surface fragments:* 25 percent gravel, 15 percent cobbles, and 15 percent stones

A—0 to 6 inches; dark yellowish brown (10YR 3/4), very stony sandy loam, yellowish brown (10YR 5/4), dry; 14 percent clay; weak fine and medium granular structure; soft, very friable, slightly sticky,

slightly plastic; many very fine roots; 15 percent gravel, 10 percent cobbles, and 15 percent stones; no effervescence; moderately alkaline, pH 8.0.

Btk—6 to 12 inches; brown (7.5YR 4/4), very stony clay loam, light brown (7.5YR 6/4), dry; 28 percent clay; moderate fine and medium subangular blocky structure; slightly hard, friable, moderately sticky, moderately plastic; carbonates disseminated throughout, 5 percent carbonate coats on rock fragments, 5 percent carbonate coats on surfaces along pores; common distinct clay films on ped faces; 15 percent gravel, 10 percent cobbles, and 15 percent stones; strong effervescence; moderately alkaline, pH 8.1.

Bk1—12 to 23 inches; brown (7.5YR 5/4), extremely stony loam, light brown (7.5YR 6/4), dry; 23 percent clay; weak fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 25 percent gravel, 15 percent cobbles, and 20 percent stones; violent effervescence; moderately alkaline, pH 8.3.

Bk2—23 to 30 inches; light yellowish brown (10YR 6/4), extremely stony loam, very pale brown (10YR 7/4), dry; 24 percent clay; weak fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 30 percent carbonate coats on rock fragments, 15 percent carbonate coats on surfaces along pores; 25 percent gravel, 15 percent cobbles, and 30 percent stones; violent effervescence; moderately alkaline, pH 8.4.

Bk3—30 to 60 inches; pale brown (10YR 6/3), extremely stony loam, very pale brown (10YR 7/3), dry; 22 percent clay; massive; 30 percent carbonate coats on rock fragments, 15 percent carbonate coats on surfaces along pores; 15 percent gravel, 15 percent cobbles, and 35 percent stones; violent effervescence; strongly alkaline, pH 8.5.

**Range in Characteristics**

*Depth to diagnostic feature:* 5 to 10 inches to argillic horizon

*Depth to secondary carbonates:* 10 to 20 inches

*Surface fragments:* 20 to 30 percent gravel, 10 to 20 percent cobbles, and 10 to 20 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 35 to 65 percent

## A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 3 to 5, dry or moist

*Chroma:* 4 to 6

## Btk horizon:

*Hue:* 5YR to 10YR  
*Value:* 4 or 5, dry or moist  
*Chroma:* 3 to 6, dry or moist  
*Texture:* clay loam, with appropriate modifier  
*Clay content:* 27 to 35 percent  
*Fragments:* 35 to 65 percent gravel, cobbles, stones

**Bk horizons:**

*Hue:* 7.5YR or 10YR  
*Value:* 4 to 6, dry or moist  
*Chroma:* 3 to 6, dry or moist  
*Texture:* loam, sandy loam, with appropriate modifiers  
*Clay content:* 18 to 27 percent  
*Fragments:* 35 to 75 percent gravel, cobbles or stones  
*Calcium carbonate equivalent:* 20 to 40 percent

**Radnik Series****Setting**

*Local phase:* moist  
*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Landform:* floodplain, alluvial flat, stream terrace  
*Parent material:* alluvium  
*Elevation:* 4,300 to 6,600 feet (1,311 to 2,012 meters)  
*Slope:* 2 to 5 percent

**Climatic data:**

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, calcareous, mesic  
 Ustic Torrifuvents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 33 minutes, 45.52 seconds north; longitude 111 degrees, 19 minutes, 9.83 seconds west; datum: NAD 83

C1—0 to 2 inches; dark yellowish brown (10YR 4/4), fine sandy loam, yellowish brown (10YR 5/6), dry; 15 percent clay; weak thin platy structure; very friable, soft, nonsticky, slightly plastic; few very fine and fine roots; few very fine and fine pores;

strong effervescence; strongly alkaline, pH 8.6; abrupt smooth boundary.

C2—2 to 5 inches; yellowish brown (10YR 5/4), fine sandy loam, light yellowish brown (10YR 6/4), dry; 12 percent clay; weak fine subangular blocky structure; very friable, soft, nonsticky, slightly plastic; common very fine and few fine roots; common very fine and few fine pores; strong effervescence; strongly alkaline, pH 8.6; abrupt smooth boundary.

C3—5 to 8 inches; brown (10YR 5/3), fine sandy loam, light yellowish brown (10YR 6/4), dry; 15 percent clay; massive; very friable, soft, nonsticky, slightly plastic; few very fine roots; few very fine pores; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

C4—8 to 11 inches; brown (10YR 5/3), very fine sandy loam, light yellowish brown (10YR 6/4), dry; 16 percent clay; massive; friable, slightly hard, nonsticky, slightly plastic; few very fine roots; few very fine pores; strong effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

C5—11 to 19 inches; dark yellowish brown (10YR 4/4), fine sand, yellowish brown (10YR 5/4), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; few very fine pores; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

C6—19 to 45 inches; 50 percent reddish brown (5YR 4/4) and 50 percent yellowish brown (10YR 5/4), stratified fine sandy loam to loam, 50 percent light reddish brown (5YR 6/4) and 50 percent light yellowish brown (10YR 6/4), dry; 15 percent clay; massive; very friable, soft, nonsticky, slightly plastic; few very fine roots; few very fine pores; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

C7—45 to 60 inches; dark yellowish brown (10YR 4/6), fine sand, yellowish brown (10YR 5/6), dry; 4 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; strong effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

**Range in Characteristics**

*Flooding:* March, April, May

*Frequency:* Rare

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

A horizon:

*Hue:* 5YR to 10YR

*Value:* 3 to 6, moist or dry

*Chroma:* 3 or 4, moist or dry

## C horizons:

*Hue:* 5YR to 10YR*Value:* 5 or 6 dry; 4 or 5 moist*Chroma:* 3 or 4, dry or moist*Texture:* loam, fine sandy loam, fine sand, loamy

fine sand, very fine sandy loam

*Fragments:* 0 to 10 percent gravel**Ranion Series****Setting***Depth class:* very deep*Drainage class:* excessively drained*Slowest permeability:* 6.0 to 20 in/hr (rapid)*Landform:* dune on structural bench*Parent material:* eolian sand*Elevation:* 3,800 to 5,200 feet (1,159 to 1,585 meters)*Slope:* 2 to 30 percent*Climatic data:**Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)*Frost-free period:* 160 to 190 days**Taxonomic class**

Siliceous, mesic Typic Torripsamments

**Typical Pedon***Location in survey area:* latitude 37 degrees, 21 minutes, 40.00 seconds north; longitude 111 degrees, 2 minutes, 49.00 seconds west; datum: NAD 83

A—0 to 5 inches; brown (7.5YR 4/4), loamy fine sand, reddish yellow (7.5YR 6/6), dry; 6 percent clay; weak thin platy parting to single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; noneffervescent; neutral, pH 7.0; clear wavy boundary.

C1—5 to 15 inches; yellowish red (5YR 4/6), loamy fine sand, reddish yellow (7.5YR 6/6), dry; 7 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; noneffervescent; neutral, pH 7.0; gradual wavy boundary.

C2—15 to 35 inches; yellowish red (5YR 5/6), loamy fine sand, reddish yellow (7.5YR 6/6), dry; 6 percent clay; massive; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; noneffervescent; neutral, pH 7.0; clear wavy boundary.

C3—35 to 55 inches; yellowish red (5YR 5/6), loamy

fine sand, strong brown (7.5YR 5/6), dry; 4 percent clay; massive; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; 2 percent gravel; noneffervescent to very slight effervescence; neutral, pH 7.2; abrupt smooth boundary.

C4—55 to 60 inches; brown (7.5YR 5/4), sand, light brown (7.5YR 6/4), dry; 2 percent clay; massive; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; 5 percent gravel; very slight effervescence; slightly alkaline, pH 7.6.

**Range in Characteristics***Particle-size control section (weighted average):**Clay content:* 1 to 8 percent

## A horizon:

*Hue:* 5YR to 10YR*Value:* 5 to 7 dry; 4 to 6 moist*Chroma:* 3 to 6

## C horizons:

*Hue:* 5YR to 10YR*Value:* 5 to 7 dry; 4 to 6 moist*Chroma:* 3 to 6*Texture:* fine sand, sand, loamy fine sand*Reaction:* neutral to moderately alkaline**Reef Series****Setting***Depth class:* very shallow to shallow*Drainage class:* somewhat excessively drained*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)*Landform:* structural bench*Parent material:* residuum*Elevation:* 5,400 to 6,900 feet (1,646 to 2,104 meters)*Slope:* 5 to 25 percent*Climatic data:**Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)*Frost-free period:* 120 to 160 days**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

**Typical Pedon***Location in survey area:* latitude 37 degrees, 51 minutes, 27.00 seconds north; longitude 111 degrees, 3 minutes, 28.00 seconds west; datum: NAD 83

*Surface fragments:* 20 percent gravel, 35 percent channers, and 5 percent flagstones

A—0 to 1 inch; brown (7.5YR 5/4), very channery sandy loam, reddish yellow (7.5YR 6/6), dry; 12 percent clay; moderate medium platy structure; very friable, soft, nonsticky, nonplastic; common very fine and few fine roots; few very fine and fine vesicular pores; 20 percent gravel and 25 percent channers; very slight effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

C1—1 to 5 inches; brown (7.5YR 4/4), extremely gravelly loam, brown (7.5YR 5/4), dry; 15 percent clay; massive; very friable, soft, nonsticky, nonplastic; few very fine roots; few very fine vesicular and few very fine and fine tubular pores; 60 percent gravel and 10 percent channers; slight effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

C2—5 to 9 inches; brown (7.5YR 4/4), extremely channery loam, light brown (7.5YR 6/6), dry; 20 percent clay; massive; very friable, soft, nonsticky, nonplastic; common very fine and fine roots; few very fine tubular pores; common very fine carbonate nodules; 40 percent gravel and 30 percent channers; strong effervescence; moderately alkaline, pH 8.4; abrupt wavy boundary.

R—9 inches; sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Depth to diagnostic feature:* 4 to 6 inches to secondary carbonates

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

*Rock fragment content:* 35 to 75 percent gravel and channers

A horizon:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6

C horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6

*Fragments:* 55 to 65 percent gravel, 5 to 15 percent channers

## Remorris Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* structural benches, escarpments and hillslopes on structural benches

*Parent material:* residuum

*Elevation:* 5,200 to 6,800 feet (1,585 to 2,073 meters)

*Slope:* 25 to 60 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 33 minutes, 17.88 seconds north; longitude 111 degrees, 25 minutes, 41.05 seconds west; datum: NAD 83

*Surface fragments:* 30 percent channers, 20 percent flagstones, 10 percent stones, and 10 percent boulders

A—0 to 3 inches; red (2.5YR 4/6), silty clay loam, red (2.5YR 5/6), dry; 30 percent clay; strong very fine and fine granular structure; very friable, soft, moderately sticky, moderately plastic; common very fine and few fine roots; many very fine and common fine pores; carbonates are disseminated; 10 percent gravel; strong effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

C1—3 to 10 inches; reddish brown (2.5YR 4/4), silty clay loam, reddish brown (2.5YR 4/4), dry; 30 percent clay; massive; firm, hard, moderately sticky, moderately plastic; few very fine and fine roots; carbonates are disseminated; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.4; gradual wavy boundary.

C2—10 to 15 inches; red (2.5YR 4/6), silty clay loam, red (2.5YR 5/6), dry; 30 percent clay; massive;

very firm, very hard, moderately sticky, moderately plastic; few very fine and fine roots; carbonates are disseminated; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.4; abrupt wavy boundary.

Cr—15 inches; weathered Morrison Formation interbedded shale and siltstone.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Surface fragments:* 5 to 35 percent channers, 5 to 25 percent flagstones, 0 to 15 percent stones, and 0 to 15 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

*Rock fragment content:* 0 to 35 percent gravel and channers

A horizons:

*Hue:* 2.5YR or 5YR

*Value:* 4 to 6 dry; 4 or 5 moist

*Chroma:* 3 to 6

C horizons:

*Hue:* 2.5YR or 5YR

*Value:* 4 to 6 dry; 4 or 5 moist

*Chroma:* 3 to 6

*Texture:* silty clay loam, clay loam, silt loam or loam

*Clay content:* 18 to 35 percent

*Fragments:* 0 to 25 percent gravel

*Calcium carbonate equivalent:* 10 to 20 percent

## Retsabal Series

### Setting

*Depth class:* very shallow and shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderately)

*Landform:* structural bench, small knolls on structural benches

*Parent material:* gypsum bedrock residuum

*Elevation:* 5,000 to 7,200 feet (1,524 to 2,195 meters)

*Slope:* 2 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy, gypsic, mesic, shallow Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 36 minutes, 38.41 seconds north; longitude 111 degrees, 18 minutes, 12.96 seconds west; datum: NAD 83

A—0 to 1 inch; strong brown (7.5YR 4/6), very fine sandy loam, strong brown (7.5YR 5/6), dry; 12 percent clay; moderate thin platy structure; loose, loose, nonsticky, nonplastic; few very fine and fine roots; few very fine and fine pores; strong effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

Cy1—1 to 3 inches; very pale brown (10YR 7/3), very fine sandy loam (more than 70 percent raw decayed gypsum), white (10YR 8/1), dry; 12 percent clay; massive; very friable, soft, nonsticky, nonplastic; few very fine roots; slightly effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Cy2—3 to 15 inches; light gray (10YR 7/2), loam (more than 70 percent weathered gypsum), very pale brown (10YR 8/2), dry; 12 percent clay; massive; very friable, soft, nonsticky, nonplastic; strong effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

Cr—15 inches; Carmel Formation gypsum bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Particle-size control section (weighted average):*

*Clay content:* 8 to 20 percent

A horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 4 to 6

Cy horizons:

*Hue:* 7.5YR to 10YR

*Value:* 6 to 8 dry; 5 to 8 moist

*Chroma:* 1 to 4

*Texture:* loam, very fine sandy loam, fine sandy loam

*Gypsum content:* 35 to 80 percent

## Rizno Series

### Setting

*Local phase:* cool

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderately)

*Landform:* structural bench

*Parent material:* siltstone and sandstone residuum

*Elevation:* 5,000 to 5,900 feet (1,524 to 1,799 meters)

*Slope:* 5 to 25 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 54 degrees F. (10.0 to 12.0 degrees C.)

*Frost-free period:* 140 to 180 days

### Taxonomic class

Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 29 minutes, 57.08 seconds north; longitude 112 degrees, 0 minutes, 32.90 seconds west; datum: NAD 83

*Surface fragments:* 40 percent channers

A—0 to 3 inches; brown (7.5YR 5/3), channery loam, light brown (7.5YR 6/3), dry; 20 percent clay; weak thin platy parting to weak fine granular structure; very friable, slightly hard, slightly sticky, moderately plastic; common very fine and few fine, medium, and coarse roots; common very fine interstitial and tubular pores; 30 percent channers; slight effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

C1—3 to 6 inches; light olive brown (2.5Y 5/3), fine sandy loam, light yellowish brown (2.5Y 6/3), dry; 17 percent clay; massive; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine, medium, and coarse roots; common very fine tubular and interstitial pores; 10 percent channers; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

C2—6 to 9 inches; light yellowish brown (2.5Y 6/3), parachannery fine sandy loam, pale yellow (2.5Y

7/3), dry; 16 percent clay; massive; friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine roots; common very fine interstitial, few very fine tubular and few fine interstitial pores; 25 percent parachanners; strong effervescence; moderately alkaline, pH 7.9; abrupt smooth boundary.

R—9 inches; calcareous Carmel Formation sandstone.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 35 to 45 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

*Rock fragment content:* 0 to 20 percent channers

C horizon:

*Value:* 6 or 7 dry; 5 or 6 moist

*Fragments:* 0 to 35 percent parachanners

*Texture:* fine sand loam, parachannery fine sand loam

## Robay Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Landform:* structural bench

*Parent material:* sandstone residuum and eolian sand

*Elevation:* 7,200 to 7,800 feet (2,195 to 2,378 meters)

*Slope:* 5 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

### Taxonomic class

Sandy-skeletal, siliceous, frigid Lithic Ustorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 51 minutes, 35.79 seconds north; longitude 111 degrees, 36 minutes, 27.42 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 35 percent cobbles, and 5 percent stones

A—0 to 3 inches; dark yellowish brown (10YR 4/4),

very cobbly fine sand, yellowish brown (10YR 5/4), dry; 1 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and fine and few medium and coarse roots; 10 percent gravel, 40 percent cobbles, and 2 percent stones; noneffervescent; slightly acid, pH 6.4; clear smooth boundary.

C—3 to 10 inches; dark yellowish brown (10YR 3/4), very cobbly fine sand, dark yellowish brown (10YR 4/4), dry; 1 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and few fine, medium, and coarse roots; 20 percent gravel and 20 percent cobbles; noneffervescent; neutral, pH 6.6; abrupt smooth boundary.

R—10 inches; Navajo Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 5 to 20 percent gravel, 15 to 45 percent cobbles, and 0 to 20 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 1 to 6 percent

*Rock fragment content:* 35 to 70 percent gravel, cobbles, and stones

A horizon:

*Value:* 4 to 6 dry; 3 to 5 moist

*Chroma:* 2 to 4

C horizon:

*Value:* 4 to 6 dry; 3 to 5 moist

*Chroma:* 2 to 4

*Texture:* fine sand, loamy fine sand, loamy sand, or sand with appropriate rock fragment modifier

*Fragments:* 35 to 70 percent gravel, cobbles, and stones

### Ruinpoint Series

#### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* alluvial flat on structural bench

*Parent material:* alluvium

*Elevation:* 5,000 to 5,800 feet (1,524 to 1,768 meters)

*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### Taxonomic class

Fine-silty, mixed, superactive, mesic Ustic Haplocambids

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 02 minutes, 40.29 seconds north; longitude 112 degrees, 11 minutes, 25.72 seconds west; datum: NAD 83

A—0 to 2 inches; dark reddish brown (5YR 3/4), silt loam, yellowish red (5YR 5/6), dry; 21 percent clay; weak thin platy structure; slight effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

Bw—2 to 10 inches; dark reddish brown (5YR 3/4), silt loam, yellowish red (5YR 5/6), dry; 22 percent clay; weak fine subangular blocky structure; slight effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Bk1—10 to 25 inches; yellowish red (5YR 4/6), silt loam, yellowish red (5YR 5/6), dry; 25 percent clay; moderate fine and medium subangular blocky structure; few fine carbonate veins and soft masses; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Bk2—25 to 60 inches; yellowish red (5YR 4/6), silt loam, yellowish red (5YR 5/6), dry; 24 percent clay; moderate fine subangular blocky structure; common soft carbonate masses; 5 percent gravel; strong effervescence; moderately alkaline, pH 8.2.

#### Range in Characteristics

*Depth to diagnostic feature:* 8 to 20 inches to secondary carbonates; 2 to 13 inches to cambic horizon

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 0 to 5 percent

Bk horizons:

*Fragments:* 0 to 10 percent gravel

*Calcium carbonate equivalent:* 5 to 15 percent

*Gypsum content:* 0 to 4 percent

### Ruko Series

#### Setting

*Depth class:* shallow

*Drainage class:* well drained

*Slowest permeability:* 0.0015 to 0.06 in/hr (very slow)

*Landform:* structural benches, ledges on escarpments

*Parent material:* colluvium, residuum

*Elevation:* 6,500 to 7,800 feet (1,982 to 2,378 meters)

*Slope:* 30 to 70 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

#### **Taxonomic class**

Clayey, smectitic, frigid, shallow Aridic Haplustepts

#### **Typical Pedon**

*Location in survey area:* latitude 37 degrees, 26 minutes, 35.34 seconds north; longitude 112 degrees, 13 minutes, 12.00 seconds west; datum: NAD 83

- A—0 to 4 inches; brown (10YR 4/3), clay loam, pale brown (10YR 6/3), dry; moderate fine granular structure; friable, soft, slightly sticky, slightly plastic; common very fine and fine roots; many fine interstitial pores; 5 percent gravel and 2 percent stones; strong effervescence; moderately alkaline, pH 8.0; clear smooth boundary.
- C1—4 to 7 inches; gray (10YR 5/1), clay, gray (10YR 6/1), dry; weak medium subangular blocky structure; firm, hard, sticky, plastic; common fine, medium, and coarse roots; few fine tubular and interstitial pores; strong effervescence; moderately alkaline, pH 8.0; gradual wavy boundary.
- C2—7 to 19 inches; gray (10YR 5/1), clay, gray (10YR 6/1), dry; weak medium subangular blocky structure; very firm, very hard, sticky, plastic; few very fine, medium, and coarse roots; few fine tubular and interstitial pores; 2 percent fine faint white (10YR 8/1) carbonate masses; strong effervescence; moderately alkaline, pH 8.0; diffuse wavy boundary.
- Cr—19 inches; Straight Cliffs Formation shale bedrock.

#### **Range in Characteristics**

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Particle-size control section (weighted average):*

*Clay content:* 35 to 45 percent

C horizons:

*Clay content:* 40 to 50 percent

*Calcium carbonate equivalent:* 15 to 30 percent

## **Sanostee Series**

### **Setting**

*Local phase:* warm

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* plain on structural bench

*Parent material:* eolian sand, sandstone residuum

*Elevation:* 4,900 to 5,800 feet (1,494 to 1,768 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### **Taxonomic class**

Fine-loamy, mixed, superactive, mesic Ustic Calcicgids

#### **Typical Pedon**

*Location in survey area:* latitude 37 degrees, 13 minutes, 38.00 seconds north; longitude 111 degrees, 28 minutes, 17.00 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel

- A1—0 to 4 inches; brown (7.5YR 4/4), fine sandy loam, brown (7.5YR 5/4), dry; 10 percent clay; single grain; very friable, soft, nonsticky, nonplastic; few very fine roots; noneffervescent; slightly alkaline, pH 7.6; clear smooth boundary.
- A2—4 to 9 inches; brown (7.5YR 4/4), fine sandy loam, brown (7.5YR 5/4), dry; 16 percent clay; weak medium subangular blocky structure; friable, slightly hard, slightly sticky, nonplastic; common very fine and few fine and medium roots; noneffervescent; slightly alkaline, pH 7.6; clear wavy boundary.
- Bt—9 to 18 inches; brown (7.5YR 4/4), sandy clay loam, brown (7.5YR 5/4), dry; 25 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, nonplastic; common very fine and few fine and medium roots; 15 percent clay films on all faces of peds and on

surfaces along pores; noneffervescent; slightly alkaline, pH 7.8; clear wavy boundary.

Btk1—18 to 26 inches; brown (7.5YR 4/4), sandy clay loam, brown (7.5YR 5/4), dry; 26 percent clay; moderate medium subangular blocky structure; friable, hard, moderately sticky, nonplastic; few very fine and fine roots; 15 percent clay films on all faces of peds and on surfaces along pores; common fine calcium carbonate veins; slight effervescence; strongly alkaline, pH 8.8; clear wavy boundary.

Btk2—26 to 30 inches; brown (7.5YR 4/4), sandy clay loam, brown (7.5YR 5/4), dry; 30 percent clay; strong medium subangular blocky structure; friable, very hard, moderately sticky, moderately plastic; few very fine roots; 15 percent clay films on surfaces along pores and on all faces of peds; common medium calcium carbonate veins; strong effervescence; strongly alkaline, pH 8.8.

Ck—30 to 35 inches; very pale brown (10YR 7/4), sandy clay loam, very pale brown (10YR 8/4), dry; 30 percent clay; massive; friable, soft, moderately sticky, moderately plastic; few very fine roots; 40 percent hard white (10YR 8/1) calcium carbonate nodules, carbonates disseminated throughout; strong effervescence; strongly alkaline, pH 8.8.

R—35 inches; Straight Cliffs Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Depth to secondary carbonate:* 18 to 29 inches

*Surface fragments:* 0 to 5 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 18 to 30 percent

A horizons:

*Value:* 5 or 6 dry

*Chroma:* 3 or 4 moist

Bt horizons:

*Hue:* 5YR or 7.5YR

*Clay content:* 20 to 35 percent

Btk, Bk horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry

*Chroma:* 3 to 6, moist or dry

*Fragments:* 0 to 5 percent gravel

*Calcium carbonate equivalent:* 15 to 30 percent

Ck horizon:

*Calcium carbonate equivalent:* 15 to 30 percent

## Santrick Series

### Setting

*Depth class:* moderately deep

*Drainage class:* excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* dune on structural bench

*Parent material:* eolian sand, residuum

*Elevation:* 5,600 to 7,000 feet (1,707 to 2,134 meters)

*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Siliceous, mesic Ustic Torripsamments

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 42 minutes, 40.56 seconds north; longitude 111 degrees, 21 minutes, 51.89 seconds west; datum: NAD 83

*Surface fragments:* 10 percent rounded gravel-sized ironstone nodules

A—0 to 4 inches; brown (7.5YR 4/4), loamy fine sand, reddish yellow (7.5YR 6/6), dry; 5 percent clay; weak fine subangular blocky structure; loose, very friable, nonsticky, nonplastic; common very fine and few fine roots; 5 percent rounded gravel-sized ironstone nodules; noneffervescent; neutral, pH 6.6; clear smooth boundary.

C1—4 to 12 inches; reddish brown (5YR 4/4), loamy fine sand, reddish brown (5YR 5/4), dry; 5 percent clay; weak medium subangular blocky structure; loose, very friable, nonsticky, nonplastic; common very fine and few fine roots; 5 percent rounded gravel-sized ironstone nodules; noneffervescent; neutral, pH 6.8; clear smooth boundary.

C2—12 to 22 inches; light reddish brown (5YR 6/4), loamy fine sand, reddish yellow (5YR 6/6), dry; 5 percent clay; weak medium subangular blocky structure; loose, very friable, nonsticky, nonplastic; common very fine and few fine roots; 5 percent rounded gravel-sized ironstone nodules; noneffervescent; neutral, pH 6.8; clear smooth boundary.

C3—22 to 28 inches; light reddish brown (5YR 6/4),

loamy fine sand, reddish yellow (5YR 6/6), dry; 5 percent clay; massive structure, few very fine roots; 5 percent rounded gravel-sized ironstone nodules; noneffervescent; neutral, pH 6.8; abrupt smooth boundary.

R—28 inches; Navajo Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Surface fragments:* 0 to 10 percent rounded gravel-sized ironstone nodules

*Particle-size control section (weighted average):*

*Clay content:* 1 to 6 percent

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 6

C horizons:

*Hue:* 5YR to 10YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 6

*Texture:* fine sand, loamy fine sand, sand or loamy sand

### Sazi Series

#### Setting

*Local phase:* moist

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* plains on structural benches

*Parent material:* eolian sand over residuum

*Elevation:* 4,600 to 6,460 feet (1,402 to 1,970 meters)

*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

#### Taxonomic class

Coarse-loamy, mixed, superactive, mesic Ustic Haplocalcids

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 32 minutes, 47.08 seconds north; longitude 111 degrees, 23 minutes, 16.38 seconds west; datum: NAD 83

A—0 to 5 inches; reddish brown (5YR 4/4), fine sandy loam, reddish brown (5YR 5/4), dry; 15 percent clay; weak fine granular structure; 2 percent gravel; slight effervescence; moderately alkaline, pH 8.0.

Bw—5 to 20 inches; reddish brown (5YR 5/4), fine sandy loam, light reddish brown (5YR 6/4), dry; 17 percent clay; weak fine and medium subangular blocky structure; 2 percent gravel; slight effervescence; moderately alkaline, pH 8.0.

Bk—20 to 38 inches; reddish brown (5YR 5/4), fine sandy loam, light reddish brown (5YR 6/4), dry; 15 percent clay; weak fine and medium subangular blocky structure; common, fine soft calcium carbonate masses; 2 percent gravel; strong effervescence; moderately alkaline, pH 8.2.

R—38 inches; Entrada Formation sandstone bedrock

#### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Depth to secondary carbonates:* 7 to 20 inches

*Surface fragments:* 0 to 10 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 10 to 18 percent

A horizon:

*Hue:* 2.5YR or 5YR

*Value:* 4 to 8 dry; 4 or 5 moist

*Chroma:* 4 to 8 dry; 4 to 6 moist

*Fragments:* 0 to 10 percent gravel

Bw horizon:

*Value:* 5 or 6 dry; 4 to 6 moist

*Chroma:* 4 to 6, dry or moist

*Fragments:* 0 to 5 percent gravel

*Calcium carbonate equivalent:* 3 to 15 percent

Bk horizon:

*Hue:* 2.5YR or 5YR

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 4 to 8, dry or moist

*Clay content:* 5 to 18 percent

*Fragments:* 0 to 20 percent gravel, 0 to 3 percent channers

*Calcium carbonate equivalent:* 15 to 30 percent

## Seeg Series

### Setting

*Local phase:* warm  
*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Landform:* fan terraces  
*Parent material:* mixed alluvium  
*Elevation:* 3,500 to 5,000 feet (1,067 to 1,524 meters)  
*Slope:* 2 to 15 percent

### Climatic data:

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, mesic Typic Haplocalcids

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 21 minutes, 42.00 seconds north; longitude 111 degrees, 8 minutes, 32.00 seconds west; datum: NAD 83

*Surface fragments:* 14 percent gravel, 12 percent cobbles, 2 percent stones, and 2 percent boulders

A—0 to 4 inches; reddish brown (5YR 4/4), gravelly loamy fine sand, reddish brown (5YR 5/4), dry; 6 percent clay; weak fine granular structure; friable, soft, nonsticky, nonplastic; few very fine and fine roots; 20 percent gravel and 5 percent cobbles; very slight effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

Bw—4 to 20 inches; yellowish red (5YR 4/6), gravelly loam, yellowish red (5YR 5/6), dry; 18 percent clay; weak medium subangular blocky structure; friable, soft, nonsticky, nonplastic; few very fine and fine roots; 25 percent gravel and 5 percent cobbles; very slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

Bk1—20 to 30 inches; light reddish brown (5YR 6/3), very gravelly loam, pink (5YR 7/3), dry; 16 percent clay; weak fine and medium subangular blocky structure; firm, slightly hard, nonsticky, nonplastic; few very fine roots; thin carbonate coats on rock fragments, calcium carbonates disseminated

throughout; 25 percent gravel, 5 percent cobbles, and 5 percent stones; slight effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

Bk2—30 to 60 inches; pink (7.5YR 7/3), very gravelly fine sandy loam, pink (5YR 8/3), dry; 16 percent clay; weak fine and medium subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; thin carbonate coats on rock fragments, calcium carbonates disseminated throughout; 30 percent gravel, 5 percent cobbles, and 10 percent stones; strong effervescence; moderately alkaline, pH 8.4.

### Range in Characteristics

*Depth to secondary carbonates:* 8 to 20 inches  
*Surface fragments:* 5 to 20 percent gravel, 0 to 15 percent cobbles, 0 to 10 percent stones, and 0 to 5 percent boulders  
*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent  
*Rock fragment content:* 35 to 40 percent gravel, cobbles, and stones

A and AB horizons:  
*Fragments:* 2 to 25 percent gravel, 0 to 15 percent cobbles, 0 to 10 percent stones

Bw and Bk horizons:  
*Hue:* 5YR or 7.5YR  
*Value:* 6 to 8 dry; 4 to 7 moist  
*Chroma:* 3 to 6, dry or moist  
*Texture:* very gravelly loam, very gravelly sandy loam, very gravelly fine sandy loam, very cobbly loamy sand, gravelly loam  
*Fragments:* 15 to 40 percent gravel, 0 to 25 percent cobbles, 0 to 20 percent stones, and 0 to 10 percent boulders  
*Calcium carbonate equivalent:* Bk: 15 to 30 percent, Bw: 5 to 15 percent

## Shalona Series

### Setting

*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Landform:* alluvial flat on structural bench  
*Parent material:* mixed alluvium, residuum  
*Elevation:* 6,200 to 6,600 feet (1,890 to 2,012 meters)  
*Slope:* 2 to 8 percent

*Climatic data:*  
*Mean annual precipitation:* 12 to 16 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F.  
(7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

#### **Taxonomic class**

Fine-loamy, mixed, superactive, mesic Aridic  
Argiustolls

#### **Typical Pedon**

*Location in survey area:* latitude 37 degrees, 15 minutes, 43.00 seconds north; longitude 111 degrees, 3 minutes, 8.00 seconds west; datum: NAD 83

A—0 to 8 inches; dark brown (10YR 3/3), sandy loam, brown (10YR 5/3), dry; 12 percent clay; weak medium granular structure; very friable, soft, nonsticky, nonplastic; many very fine and few fine and medium roots; common very fine interstitial and few fine tubular pores; noneffervescent; slightly alkaline, pH 7.8; clear smooth boundary.

AB—8 to 13 inches; dark yellowish brown (10YR 3/4), loam, yellowish brown (10YR 5/4), dry; 25 percent clay; moderate medium granular structure; friable, soft, slightly sticky, slightly plastic; common very fine and few fine roots; few very fine tubular and fine interstitial pores; noneffervescent; slightly alkaline, pH 7.8; clear wavy boundary.

Bt—13 to 29 inches; brown (10YR 4/3), clay loam, pale brown (10YR 6/3), dry; 28 percent clay; moderate fine and medium subangular blocky structure; firm, slightly hard, moderately sticky, moderately plastic; few very fine and medium roots; few very fine interstitial and fine tubular pores; common clay films on all faces of peds; very slight effervescence; slightly alkaline, pH 7.8; clear smooth boundary.

Btk—29 to 43 inches; brown (10YR 5/3), clay loam, light yellowish brown (10YR 6/4), dry; 30 percent clay; moderate medium and coarse subangular blocky structure; firm, hard, moderately sticky, moderately plastic; few very fine roots; few very fine interstitial and fine tubular pores; common carbonate coats on all faces of peds, common clay films on all faces of peds; 2 percent gravel; slight effervescence; moderately alkaline, pH 8.1; clear smooth boundary.

Ck—43 to 60 inches; yellowish brown (10YR 5/4), loam, light yellowish brown (10YR 6/4), dry; 26 percent clay; massive; very firm, very hard, moderately sticky, moderately plastic; common very fine interstitial pores; 3 percent gravel, 2 percent cobbles, and 2 percent stones; slight effervescence; moderately alkaline, pH 8.4.

#### **Range in Characteristics**

*Depth to secondary carbonates:* 20 to 40 inches

*Particle-size control section (weighted average):*

*Clay content:* 27 to 35 percent

Bt and Btk horizons:

*Clay content:* 27 to 40 percent

*Fragments:* 0 to 5 percent gravel

*Calcium carbonate equivalent:* 0 to 15 percent

Ck horizon:

*Fragments:* 0 to 5 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

### **Sheecal Family**

#### **Setting**

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Landform:* ledge on escarpment, hillslope

*Parent material:* colluvium, residuum, slope alluvium

*Elevation:* 6,500 to 7,500 feet (1,982 to 2,287 meters)

*Slope:* 50 to 80 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F.  
(5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

#### **Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, frigid  
Aridic Ustorthents

#### **Typical Pedon**

*Location in survey area:* latitude 37 degrees, 16 minutes, 25.00 seconds north; longitude 111 degrees, 4 minutes, 41.00 seconds west; datum: NAD 83

*Surface fragments:* 15 percent gravel, 10 percent cobbles, 10 percent stones, and 10 percent boulders

A—0 to 4 inches; brown (10YR 4/3), very stony sandy loam, brown (10YR 5/3), dry; 14 percent clay; weak fine and medium platy structure; very friable, soft, nonsticky, nonplastic; few very fine and fine roots; 15 percent gravel, 10 percent cobbles, and 15 percent stones; very slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

C1—4 to 15 inches; grayish brown (10YR 5/2), very

cobbly loam, light brownish gray (10YR 6/2), dry; 24 percent clay; massive; firm, slightly hard, slightly sticky, slightly plastic; few very fine and medium roots; 10 percent gravel, 20 percent cobbles, and 10 percent stones; slight effervescence; moderately alkaline, pH 8.2; gradual wavy boundary.

C2—15 to 34 inches; grayish brown (2.5Y 5/2), very stony clay loam, light brownish gray (2.5Y 6/2), dry; 30 percent clay; massive; firm, hard, moderately sticky, moderately plastic; few fine, medium, and coarse roots; 10 percent gravel, 20 percent cobbles, and 15 percent stones; slight effervescence; moderately alkaline, pH 8.2; abrupt wavy boundary.

R—34 inches; Straight Cliffs Formation sandstone bedrock

#### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Surface fragments:* 10 to 20 percent gravel, 5 to 15 percent cobbles, 5 to 15 percent stones, and 5 to 15 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 20 to 30 percent

*Rock fragment content:* 15 to 60 percent gravel, cobbles, and stones

C horizons:

*Hue:* 2.5Y to 10YR

*Fragments:* 5 to 15 percent gravel, 15 to 25 percent cobbles, 5 to 20 percent stones

## Sheppard Series

#### Setting

*Depth class:* very deep

*Drainage class:* somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* dune on structural bench

*Parent material:* eolian sand

*Elevation:* 3,500 to 5,000 feet (1,067 to 1,524 meters)

*Slope:* 2 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

#### Taxonomic class

Mixed, mesic Typic Torripsamments

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 21 minutes, 40.00 seconds north; longitude 111 degrees, 5 minutes, 10.00 seconds west; datum: NAD 83

A—0 to 5 inches; reddish brown (5YR 4/4), loamy fine sand, reddish brown (5YR 5/4), dry; 5 percent clay; weak fine granular structure; loose, loose, nonsticky, nonplastic; few very fine and fine roots; many very fine interstitial pores; very slight effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

C1—5 to 35 inches; yellowish red (5YR 5/6), fine sand, light reddish brown (5YR 6/4), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; very slight effervescence; moderately alkaline, pH 8.0; gradual wavy boundary.

C2—35 to 60 inches; reddish brown (5YR 5/4), fine sand, reddish yellow (5YR 6/6), dry; 3 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; slight effervescence; moderately alkaline, pH 8.3.

#### Range in Characteristics

*Particle-size control section (weighted average):*

*Clay content:* 3 to 8 percent

A horizon:

*Hue:* 5YR or 7.5YR

*Value:* 5 or 6 dry

*Chroma:* 3 to 6 dry or moist

C horizons:

*Hue:* 5YR or 7.5YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 4 to 6 dry; 3 to 6 moist

*Texture:* fine sand, loamy fine sand

## Sili Series

#### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Landform:* alluvial fans, valley bottoms

*Parent material:* alluvium, slope alluvium  
*Elevation:* 6,260 to 7,060 feet (1,909 to 2,152 meters)  
*Slope:* 2 to 8 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

**Taxonomic class**

Fine, smectitic, mesic Aridic Haplustepts

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 25 minutes, 32.52 seconds north; longitude 112 degrees, 12 minutes, 45.30 seconds west; datum: NAD 83

A—0 to 2 inches; dark grayish brown (2.5Y 4/2) silty clay loam, light yellowish brown (2.5Y 6/3), dry; 28 percent clay; moderate medium platy parting to moderate very fine granular structure; very friable, soft, moderately sticky, slightly plastic; many very fine and fine and few medium roots; many very fine irregular pores; slight effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

Bt1—2 to 5 inches; very dark grayish brown (2.5Y 3/2) silty clay loam, light olive brown (2.5Y 5/3), dry; 36 percent clay; strong very fine angular blocky structure; friable, slightly hard, very sticky, moderately plastic; common very fine, many fine and few medium roots; many very fine irregular pores; many thin clay films on all faces of peds; slight effervescence; moderately alkaline, pH 8.0; gradual smooth boundary.

Bt2—5 to 28 inches; very dark grayish brown (2.5Y 3/2) clay loam, light olive brown (2.5Y 5/3), dry; 38 percent clay; strong medium angular blocky structure; friable, slightly hard, very sticky, moderately plastic; many thick clay films on all faces of peds; strong effervescence; moderately alkaline, pH 8.0; gradual smooth boundary.

C—28 to 60 inches; 60 percent very dark grayish brown (2.5Y 3/2) and 40 percent light olive brown (2.5Y 5/4) clay loam, 60 percent light olive brown (2.5Y 5/3) and 40 percent light yellowish brown (2.5Y 6/4), dry; 35 percent clay; few thin clay films on all faces of peds; strong effervescence; moderately alkaline, pH 8.0.

**Range in Characteristics**

*Particle-size control section (weighted average):*  
*Clay content:* 35 to 40 percent

Bt horizons:

*Texture:* silty clay loam, clay loam

**Simel Series**

**Setting**

*Local phase:* Steep

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (moderately slow)

*Landform:* structural bench

*Parent material:* residuum, alluvium

*Elevation:* 4,500 to 6,800 feet (1,372 to 2,073 meters)

*Slope:* 2 to 60 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

**Taxonomic class**

Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 34 minutes, 20.49 seconds north; longitude 111 degrees, 15 minutes, 16.93 seconds west; datum: NAD 83

*Surface fragments:* 10 percent channers

A—0 to 2 inches; red (2.5YR 4/6), sandy loam, red (2.5YR 4/8), dry; 15 percent clay; weak fine granular parting to single grain; friable, slightly hard, nonsticky, nonplastic; common very fine and fine roots; 5 percent channers; carbonates are disseminated; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

C—2 to 7 inches; dark reddish brown (2.5YR 3/4), silty clay loam, dark reddish brown (2.5YR 3/4), dry; 33 percent clay; massive; friable, slightly hard, moderately sticky, moderately plastic; common

very fine and fine and few medium roots; few very fine and fine tubular pores; 5 percent channers; carbonates are disseminated; strong effervescence; moderately alkaline, pH 8.4; abrupt wavy boundary.

Cr—7 to 12 inches; thin platy decomposed shale and siltstone.

R—12 inches; Carmel Formation siltstone bedrock

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 25 percent gravel, 0 to 65 percent channers, and 0 to 10 percent flagstones

*Particle-size control section (weighted average):*

*Clay content:* 25 to 35 percent

*Rock fragments content:* 0 to 30 percent gravel, channers, and parachanners

A horizons:

*Hue:* 2.5YR or 5YR

*Value:* 4 to 6 dry; 3 or 4 moist

*Chroma:* 4 to 8 dry or moist

*Fragments:* 0 to 20 percent gravel, 5 to 30 percent channers, and 0 to 5 percent stones

C and Bw horizons:

*Hue:* 2.5YR or 5YR

*Value:* 4 to 6 dry, 3 or 4 moist

*Chroma:* 3 to 8 dry or moist

*Texture:* loam, silty clay loam, silt loam and sandy clay loam, with appropriate modifiers

*Clay content:* 20 to 40 percent

*Fragments:* 0 to 45 percent channers and parachanners

*Calcium carbonate equivalent:* 10 to 30 percent

## Skos Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* hillslopes on structural bench, structural bench

*Parent material:* siltstone and sandstone residuum

*Elevation:* 5,000 to 6,700 feet (1,524 to 2,043 meters)

*Slope:* 4 to 60 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 42 minutes, 1.11 seconds north; longitude 111 degrees, 21 minutes, 7.06 seconds west; datum: NAD 83

*Surface fragments:* 10 percent channers

A—0 to 2 inches; red (2.5YR 4/6), channery loam, red (2.5YR 5/6), dry; 26 percent clay; weak fine granular structure; very friable, slightly hard, slightly sticky, slightly plastic; 5 percent gravel and 25 percent channers; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

C1—2 to 4 inches; reddish brown (2.5YR 4/4), very channery loam, reddish brown (2.5YR 4/4), dry; 24 percent clay; massive; friable, slightly hard, slightly sticky, slightly plastic; 5 percent gravel and 40 percent channers; strong effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

C2—4 to 8 inches; reddish brown (2.5YR 4/4), very channery loam, reddish brown (2.5YR 4/4), dry; 24 percent clay; massive; friable, slightly hard, slightly sticky, slightly plastic; carbonate coats on rock fragments, 5 percent gravel and 45 percent channers; strong effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

R—8 inches; Carmel Formation Siltstone bedrock

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 15 percent gravel, 15 to 70 percent channers, and 0 to 15 percent flagstones

*Particle-size control section (weighted average):*

*Clay content:* 20 to 35 percent

*Rock fragment content:* 35 to 60 percent, dominantly gravel and channers

A horizons:

*Value:* 4 or 5 dry; 3 or 4 moist

*Chroma:* 4 to 6 moist

*Fragments:* 2 to 35 percent gravel and 0 to 55 percent channers

C horizons:

*Value:* 4 or 5 dry; 3 to 5 moist

*Chroma:* 4 to 6 dry or moist

*Texture:* very channery sandy clay loam, very channery loam

*Fragments:* 0 to 10 percent gravel, 0 to 45 percent cobbles, and 15 to 60 percent channers

## Skyvillage Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* structural bench

*Parent material:* sandstone residuum, slope alluvium

*Elevation:* 4,800 to 6,500 feet (1,463 to 1,982 meters)

*Slope:* 2 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 19 minutes, 28.00 seconds north; longitude 111 degrees, 39 minutes, 24.00 seconds west; datum: NAD 83

A—0 to 3 inches; dark grayish brown (10YR 4/2), loamy sand, grayish brown (10YR 5/2), dry; 9 percent clay; weak fine granular structure; noneffervescent; slightly alkaline, pH 7.8.

C1—3 to 8 inches; dark grayish brown (10YR 4/2), sandy loam, pale brown (10YR 6/3), dry; 13 percent clay; weak medium granular structure; slight effervescence; moderately alkaline, pH 8.0.

C2—8 to 13 inches; grayish brown (10YR 5/2), gravelly loam, pale brown (10YR 6/3), dry; 19 percent clay; weak fine subangular blocky structure; 10 percent gravel and 5 percent cobbles; strong effervescence; moderately alkaline, pH 8.2.

R—13 inches; Kaiparowits Formation sandstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 20 percent gravel

*Particle-size control section (weighted average):*

*Clay content:* 10 to 27 percent

A horizon:

*Hue:* 2.5Y to 7.5YR

*Value:* 5 to 7 dry; 4 or 5 moist

*Chroma:* 2 to 4, dry or moist

*Fragments:* 0 to 20 percent gravel

C horizons:

*Hue:* 2.5YR to 7.5YR

*Value:* 6 or 7 dry; 4 or 5 moist

*Chroma:* 2 to 4 dry or moist

*Texture:* loam, sandy clay loam, very gravelly sandy loam, gravelly loam, sandy loam

*Fragments:* 0 to 45 percent gravel and 0 to 10 percent cobbles

*Calcium carbonate equivalent:* less than 15 percent

## Sojourn Family

### Setting

*Depth class:* shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landscape:* hillslopes, hillslopes on structural bench

*Parent material:* residuum

*Elevation:* 5,800 to 7,200 feet (1,768 to 2,195 meters)

*Slope:* 10 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Loamy, mixed, active, calcareous, mesic, shallow Aridic Ustorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 28 minutes, 23.11 seconds north; longitude 112 degrees, 6 minutes, 31.70 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 10 percent cobbles, and 30 percent channers

A—0 to 5 inches; reddish brown (2.5YR 4/4), sandy loam, red (2.5YR 4/6), dry; 17 percent clay; weak very fine granular structure; very friable, soft, nonsticky, nonplastic; common fine roots;

common very fine interstitial pores; 5 percent gravel and 5 percent channers; strong effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

C1—5 to 7 inches; dark red (2.5YR 3/6), loam, red (2.5YR 4/6), dry; 19 percent clay; weak fine subangular blocky structure; very friable, soft, nonsticky, slightly plastic; common fine roots; common very fine interstitial pores; 5 percent channers and 5 percent flagstones; violent effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

C2—7 to 15 inches; dark reddish brown (2.5YR 3/4), loam, reddish brown (2.5YR 5/4), dry; 20 percent clay; massive; friable, slightly sticky, slightly plastic; few fine roots; few very fine interstitial pores; 10 percent channers; violent effervescence; moderately alkaline, pH 8.4; abrupt irregular boundary.

Cr—15 inches; Carmel Formation siltstone weathered bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Surface fragments:* 5 to 10 percent gravel, 2 to 10 percent cobbles, 25 to 35 percent channers, 0 to 5 percent stones, and 0 to 5 percent boulders

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 20 percent

A horizon:

*Hue:* 2.5YR or 5YR

*Value:* 3 or 4 moist

*Chroma:* 3 or 4 moist

*Fragments:* 0 to 10 percent gravel and 0 to 10 percent channers

C horizons:

*Hue:* 2.5YR or 5YR

*Value:* 3 or 4 moist

*Chroma:* 4 to 6 moist

*Texture:* loam, loamy sand

*Clay content:* 8 to 20 percent

*Fragments:* 0 to 15 percent parachanners, 0 to 30 percent channers, and 0 to 10 percent flagstones

### Somorent Series

#### Setting

*Depth class:* shallow

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* hillslope on escarpment and structural bench

*Parent material:* eolian sand, residuum, alluvium

*Elevation:* 4,500 to 5,500 feet (1,372 to 1,677 meters)

*Slope:* 15 to 40 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

#### Taxonomic class

Loamy, mixed, superactive, calcareous, mesic, shallow Typic Torriorthents

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 22 minutes, 28.00 seconds north; longitude 111 degrees, 10 minutes, 30.00 seconds west; datum: NAD 83

*Surface fragments:* 2 percent gravel and 6 percent cobbles

A—0 to 5 inches; brown (10YR 4/3), sandy loam, very pale brown (10YR 7/3), dry; 14 percent clay; weak fine and medium granular structure; very friable, soft, nonsticky, nonplastic; few fine and medium roots; many very fine interstitial pores; 2 percent gravel; slightly effervescence; moderately alkaline, pH 8.1; clear smooth boundary.

C—5 to 12 inches; brown (10YR 5/3), sandy loam, light gray (10YR 7/2), dry; 15 percent clay; weak medium granular structure; very friable, soft, nonsticky, nonplastic; few very fine and fine roots; many very fine interstitial pores; 5 percent gravel; slight effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

Cr—12 inches; soft Morrison Formation sandstone bedrock

#### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent

*Rock fragment content:* 0 to 15 percent gravel

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 6 or 7 dry, 4 to 6 moist

*Chroma:* 2 to 4 dry or moist

*Fragments:* 0 to 5 percent gravel

## C horizon:

*Hue:* 7.5YR or 10YR  
*Value:* 6 or 7 dry, 5 or 6 moist  
*Chroma:* 2 to 4 dry or moist  
*Texture:* sandy loam, fine sandy loam  
*Clay content:* 8 to 18 percent  
*Fragments:* 0 to 15 percent gravel

**Spooky Series****Setting**

*Depth class:* deep  
*Drainage class:* excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Landform:* dune on structural bench  
*Parent material:* eolian sand, sandstone residuum  
*Elevation:* 4,500 to 5,200 feet (1,372 to 1,585 meters)  
*Slope:* 2 to 15 percent

*Climatic data:*  
*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

**Taxonomic class**

Siliceous, mesic Typic Torripsamments

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 27 minutes, 47.00 seconds north; longitude 111 degrees, 11 minutes, 7.00 seconds west; datum: NAD 83

- A—0 to 4 inches; yellowish red (5YR 4/6), loamy fine sand, yellowish red (5YR 5/6), dry; 2 percent clay; weak fine platy parting to single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; 2 percent gravel; noneffervescent; moderately alkaline, pH 8.0; clear smooth boundary.
- C1—4 to 14 inches; yellowish red (5YR 5/6), loamy fine sand, reddish yellow (5YR 6/6), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; noneffervescent; moderately alkaline, pH 8.1; gradual wavy boundary.
- C2—14 to 38 inches; yellowish red (5YR 5/6), loamy fine sand, reddish yellow (5YR 6/6), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; noneffervescent; moderately alkaline, pH 8.1; gradual wavy boundary.

C3—38 to 46 inches; yellowish red (5YR 5/6), loamy fine sand; reddish yellow (5YR 6/6), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; 3 percent gravel; noneffervescent to slightly effervescent, moderately alkaline, pH 8.1; abrupt smooth boundary.

R—46 inches; Navajo Formation sandstone bedrock

**Range in Characteristics**

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Particle-size control section (weighted average):*  
*Clay content:* 1 to 5 percent  
*Rock fragments content:* 0 to 5 percent, dominantly Navajo sandstone gravel

## A horizon:

*Hue:* 5YR to 10YR  
*Value:* 5 to 7 dry; 4 to 6 moist  
*Chroma:* 3 to 6

## C horizons:

*Hue:* 5YR to 10YR  
*Value:* 5 to 7 dry; 4 to 6 moist  
*Chroma:* 3 to 6  
*Texture:* fine sand, loamy fine sand  
*Fragments:* 0 to 5 percent gravel

**Stent Series****Setting**

*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.6 to 2 in/hr (moderate)  
*Landform:* pediment, stream terrace  
*Parent material:* mixed alluvium  
*Elevation:* 4,100 to 4,900 feet (1,250 to 1,494 meters)  
*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, mesic Typic Haplocalcids

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 8 minutes, 44.35 seconds north; longitude 111

degrees, 55 minutes, 0.18 seconds west; datum: NAD 83

Surface fragments: 30 percent gravel, 5 percent cobbles, and 5 percent channers,

A—0 to 4 inches; dark yellowish brown (10YR 4/4), very gravelly fine sandy loam, pale brown (10YR 6/3), dry; 16 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common very fine tubular pores; 30 percent gravel, 2 percent cobbles, and 5 percent channers; strong effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

Bw—4 to 9 inches; dark yellowish brown (10YR 4/4), gravelly loam, light yellowish brown (10YR 6/4), dry; 22 percent clay; weak medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common very fine and fine and few medium tubular pores; 25 percent gravel and 5 percent cobbles; strong effervescence; strongly alkaline, pH 8.6; clear wavy boundary.

Bk1—9 to 20 inches; yellowish brown (10YR 5/4), very gravelly sandy clay loam, very pale brown (10YR 7/4), dry; 21 percent clay; weak fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and few fine tubular pores; common thin carbonate coats on rock fragments; 40 percent gravel and 10 percent cobbles; violent effervescence; strongly alkaline, pH 8.7; clear smooth boundary.

Bk2—20 to 25 inches; yellowish brown (10YR 5/4), very gravelly sandy loam, very pale brown (10YR 7/3), dry; 17 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine roots; common very fine tubular and interstitial pores; common moderately thick carbonate coats on rock fragments; 35 percent gravel, 1 percent cobbles, and 2 percent channers; violent effervescence; strongly alkaline, pH 8.6; abrupt smooth boundary.

Bk3—25 to 35 inches; light yellowish brown (10YR 6/4), very gravelly sandy loam, very pale brown (10YR 7/4), dry; 11 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine roots; many very fine interstitial pores; carbonate coats on rock fragments and on

all faces of peds; 50 percent gravel, 2 percent cobbles, and 2 percent channers; violent effervescence; strongly alkaline, pH 8.5; abrupt smooth boundary.

Bk4—35 to 46 inches; light yellowish brown (10YR 6/4), very gravelly loam, very pale brown (10YR 7/4), dry; 21 percent clay; weak fine and medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; common very fine interstitial and tubular pores; common thin carbonate veins, carbonate coats on rock fragments; 40 percent gravel and 5 percent cobbles; violent effervescence; strongly alkaline, pH 8.6; abrupt wavy boundary.

C1—46 to 72 inches; yellowish brown (10YR 5/4), gravelly fine sandy loam, light yellowish brown (10YR 6/4), dry; 12 percent clay; single grain; loose, loose, slightly sticky, slightly plastic; few very fine roots; many very fine interstitial pores; few fine gypsum crystals, 25 percent gravel, 1 percent cobbles, and 5 percent channers; strong effervescence; strongly alkaline, pH 8.7; abrupt smooth boundary.

C2—72 to 79 inches; yellowish brown (10YR 5/6), gravelly sandy loam, yellow (10YR 7/6), dry; 18 percent clay; massive; very friable, soft, slightly sticky, slightly plastic; few very fine roots; many very fine interstitial pores; few fine gypsum crystals; 25 percent gravel and 3 percent cobbles; strong effervescence; moderately alkaline, pH 8.3.

### Range in Characteristics

*Depth to secondary carbonates:* 8 to 12 inches

*Surface fragments:* 25 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent channers,

*Particle-size control section (weighted average):*

*Clay content:* 8 to 22 percent

*Rock fragment content:* 35 to 60 percent gravel and cobbles, 0 to 10 percent channers, and 0 to 10 percent stones

A horizon:

*Fragments:* 25 to 35 percent gravel, 0 to 5 percent cobbles, and 0 to 10 percent channers

Bw horizon:

*Fragments:* 20 to 30 percent gravel and 0 to 10 percent cobbles

Bk horizons:

*Value:* 5 or 6 moist

*Texture:* very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam

*Clay content:* 8 to 22 percent  
*Fragments:* 30 to 55 percent gravel, 0 to 15 percent cobbles, and 0 to 10 percent channers  
*Calcium carbonate equivalent:* 15 to 30 percent

C horizons:

*Value:* 6 or 7 dry  
*Chroma:* 4 to 6, moist or dry  
*Texture:* gravelly fine sandy loam, gravelly sandy loam  
*Fragments:* 20 to 30 percent gravel, 0 to 5 percent cobbles, and 0 to 10 percent channers

## Strell Series

### Setting

*Depth class:* very shallow to shallow  
*Drainage class:* somewhat excessively drained  
*Slowest permeability:* 6.0 to 20 in/hr (rapid)  
*Landform:* structural benches and hillslopes  
*Parent material:* eolian sand from Navajo Sandstone  
*Elevation:* 7,200 to 7,800 feet (2,195 to 2,378 meters)  
*Slope:* 5 to 30 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)  
*Frost-free period:* 70 to 90 days

### Taxonomic class

Frigid, coated Lithic Quartzipsamments

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 51 minutes, 22.88 seconds north; longitude 111 degrees, 36 minutes, 32.30 seconds west; datum: NAD 83

*Surface fragments:* 5 percent gravel, 10 percent cobbles, and 1 percent stones

A—0 to 3 inches; dark yellowish brown (10YR 4/4), loamy fine sand, yellowish brown (10YR 5/4), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine and fine and few medium roots; noneffervescent; neutral, pH 6.6; gradual smooth boundary.

C—3 to 10 inches; dark yellowish brown (10YR 4/4), fine sand, yellowish brown (10YR 5/4), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine, common fine and many medium roots; noneffervescent; neutral, pH 6.6; abrupt irregular boundary.

R—10 inches; Navajo Formation sandstone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Surface fragments:* 0 to 5 percent gravel, 0 to 10 percent cobbles, 0 to 5 percent stones  
*Particle-size control section (weighted average):*  
*Clay content:* 0 to 5 percent

## Strych Series

### Setting

*Local phase:* moist  
*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Landform:* remnant stream terraces  
*Parent material:* alluvium  
*Elevation:* 4,500 to 7,200 feet (1,372 to 2,195 meters)  
*Slope:* 2 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, mesic Ustic Haplocalcids

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 9 minutes, 34.42 seconds north; longitude 111 degrees, 57 minutes, 49.92 seconds west; datum: NAD 83

*Surface fragments:* 20 percent gravel, 10 percent cobbles, 15 percent channers, 10 percent stones, and 15 percent boulders

A—0 to 5 inches; reddish brown (5YR 4/4), extremely bouldery fine sandy loam, light brown (7.5YR 6/4), dry; 16 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common very fine, fine, and medium roots and few coarse roots; common very fine tubular and many very fine interstitial pores; 10 percent cobbles, 25 percent channers, 10 percent stones, and 15 percent boulders; very slight effervescence; moderately alkaline, pH 7.9; clear wavy boundary.  
 Bw—5 to 11 inches; yellowish red (5YR 4/6), very stony loam, yellowish red (5YR 5/6), dry; 19

percent clay; weak fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, and medium roots and few coarse roots; common very fine and fine and few medium tubular pores; 15 percent gravel, 5 percent cobbles, 10 percent channers, 10 percent stones, and 5 percent boulders; very slight effervescence; moderately alkaline, pH 8.0; clear wavy boundary.

Bk1—11 to 18 inches; yellowish red (5YR 5/6), very stony fine sandy loam, light reddish brown (5YR 6/4), dry; 17 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine, fine, and medium roots and few coarse roots; common very fine and fine tubular pores; 30 percent moderately thick carbonate coats on all faces of peds; 25 percent gravel, 5 percent cobbles, 15 percent stone and 5 percent boulders; strong effervescence; moderately alkaline, pH 8.2; gradual wavy boundary.

Bk2—18 to 60 inches; yellowish red (5YR 5/6), very stony fine sandy loam, pink (5YR 7/4), dry; 16 percent clay; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine and medium roots; common very fine and fine tubular pores; 30 percent moderately thick carbonate coats on all faces of peds; 15 percent gravel, 10 percent cobbles, 10 percent channers, 15 percent stone and 5 percent boulders; violent effervescence; strongly alkaline, pH 8.6.

#### Range in Characteristics

*Depth to secondary carbonates:* 4 to 12 inches

*Surface fragments:* 0 to 40 percent gravel, 0 to 15 percent cobbles, 0 to 20 percent channers, 0 to 15 percent stones, and 0 to 20 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 8 to 27 percent

*Rock fragment content:* 35 to 75 percent

A horizons:

*Hue:* 5YR to 10YR

*Chroma:* 2 to 6, dry or moist

*Fragments:* 10 to 35 percent gravel, 0 to 15 percent cobbles, 0 to 30 percent channers, 0 to 15 percent stones, and 0 to 20 percent boulders

Bw horizons:

*Hue:* 5YR to 10YR

*Value:* 5 or 6 dry

*Chroma:* 3 to 6, dry and moist

*Texture:* gravelly fine sandy loam, very stony loam

*Fragments:* 0 to 35 percent gravel, 0 to 15 percent

cobbles, 0 to 30 percent channers, 0 to 15 percent stones, and 0 to 20 percent boulders

Bk horizons:

*Hue:* 5YR to 10YR

*Value:* 6 or 7 dry; 4 or 5 moist

*Chroma:* 3 or 4 dry; 3 to 6 moist

*Texture:* very gravelly fine sandy loam, cobbly fine sandy loam, very stony fine sandy loam, very cobbly sandy loam, very gravelly sandy loam, gravelly loam

*Fragments:* 0 to 50 percent gravel, 0 to 30 percent cobbles, 0 to 30 percent channers, 0 to 20 percent stones, and 0 to 10 percent boulders

*Calcium carbonate equivalent:* 15 to 30 percent

## Suwanee Series

### Setting

*Local phase:* saline

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* flood plain, stream terrace

*Parent material:* mixed alluvium

*Elevation:* 4,300 to 6,500 feet (1,311 to 1,982 meters)

*Slope:* 0 to 5 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifuvents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 9 minutes, 12.50 seconds north; longitude 112 degrees, 5 minutes, 41.88 seconds west; datum: NAD 83

Surface fragments: 1 percent gravel

A—0 to 8 inches; reddish brown (5YR 4/4), loam, light brown (7.5YR 6/3), dry; 25 percent clay; moderate thin platy structure; very friable, slightly hard, slightly sticky, moderately plastic; common very fine, fine, and medium roots and few coarse roots; common very fine and fine tubular pores; 1 percent gravel; slight effervescence; moderately alkaline, pH 8.3; abrupt smooth boundary.

- C1—8 to 16 inches; reddish brown (5YR 5/4), loam, light reddish brown (5YR 6/4), dry; 26 percent clay; weak medium platy structure; friable, slightly hard, slightly sticky, moderately plastic; common very fine, fine, and medium roots and few coarse roots; common very fine and fine and few medium coarse tubular pores; strong effervescence; strongly alkaline, pH 8.5; clear smooth boundary.
- C2—16 to 37 inches; reddish brown (5YR 5/4), loam, light reddish brown (5YR 6/4), dry; 23 percent clay; weak medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and fine and few medium tubular pores; common carbonate veins; slight effervescence; strongly alkaline, pH 8.6; abrupt wavy boundary.
- C3—37 to 39 inches; yellowish brown (10YR 5/4), loam, very pale brown (10YR 7/3), dry; 18 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and fine fine tubular pores; 3 percent gravel; strong effervescence; strongly alkaline, pH 8.7; abrupt wavy boundary.
- C4—39 to 45 inches; yellowish red (5YR 5/6), very fine sandy loam, light reddish brown (5YR 6/4), dry; 16 percent clay; moderate thick and weak thin platy structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine, medium, and coarse roots; common very fine and fine and few medium tubular pores; strong effervescence; strongly alkaline, pH 8.5; abrupt smooth boundary.
- C5—45 to 48 inches; light yellowish brown (2.5Y 6/4), loam, pale yellow (2.5Y 7/3), dry; 20 percent clay; weak thin platy structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine, medium, and coarse roots; common very fine and few fine tubular pores; strong effervescence; strongly alkaline, pH 8.6; abrupt wavy boundary.
- C6—48 to 57 inches; brown (7.5YR 5/4), fine sandy loam, light brown (7.5YR 6/3), dry; 12 percent clay; weak medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and few fine, medium, and coarse roots; common very fine and few fine tubular pores; 1 percent gravel; strong effervescence; moderately alkaline, pH 8.4; clear wavy boundary.
- C7—57 to 79 inches; yellowish brown (10YR 5/6),

loamy fine sand, light yellowish brown (10YR 6/4), dry; 5 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine, fine, medium, and coarse roots; few very fine and fine tubular and many very fine interstitial pores; 2 percent gravel; slight effervescence; strongly alkaline, pH 8.5.

#### Range in Characteristics

*Flooding potential:* March, April, July, August, September

*Frequency:* Rare

*Particle-size control section (weighted average):*

*Clay content:* 18 to 35 percent

A horizon:

*Hue:* 5YR or 7.5YR

*Chroma:* 3 or 4 dry

*Fragments:* 0 to 5 percent gravel

C horizons:

*Hue:* 2.5YR to 2.5Y

*Value:* 6 or 7 dry; 4 to 6 moist

*Chroma:* 3 or 4 dry; 4 to 6 moist

*Texture:* fine sandy loam, sandy clay loam, loam, very fine sandy loam, loamy fine sand

*Fragments:* 0 to 5 percent gravel and 0 to 10 percent channers

### Suzipon Series

#### Setting

*Depth class:* very shallow to shallow

*Drainage class:* somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* sand sheet on structural bench, dune on structural bench

*Parent material:* eolian sand, sandstone residuum

*Elevation:* 4,500 to 5,200 feet (1,372 to 1,585 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

#### Taxonomic class

Siliceous, mesic Lithic Torripsamments

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 27

minutes, 53.00 seconds north; longitude 111 degrees, 10 minutes, 41.00 seconds west; datum: NAD 83

Surface fragments: 15 percent gravel, 10 percent cobbles

A—0 to 8 inches; yellowish red (5YR 4/6), loamy fine sand, reddish yellow (5YR 6/6), dry; 5 percent clay; weak fine and medium granular structure; soft, very friable, nonsticky, nonplastic; few very fine roots; many very fine interstitial and few fine tubular pores; 10 percent gravel and 1 percent cobbles; noneffervescent; neutral, pH 7.0; abrupt wavy boundary.

R—8 inches; Navajo Formation sandstone bedrock

#### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Particle-size control section (weighted average):*

*Clay content:* 1 to 6 percent

A, AC and C horizons:

*Hue:* 5YR to 10YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 6

*Clay content:* 1 to 6 percent

*Fragments:* 0 to 15 percent, dominantly gravel

### Suzmayne Series

#### Setting

*Depth class:* moderately deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* hillslopes and ridges on structural benches

*Parent material:* sandstone residuum

*Elevation:* 6,300 to 7,600 feet (1,921 to 2,317 meters)

*Slope:* 10 to 40 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

#### Taxonomic class

Loamy-skeletal, mixed, superactive, calcareous, mesic  
Aridic Ustorthents

#### Typical Pedon

*Location in survey area:* latitude 37 degrees, 39 minutes, 1.00 seconds north; longitude 111 degrees, 42 minutes, 57.00 seconds west; datum: NAD 83

*Surface fragments:* 15 percent gravel, 5 percent cobbles, 15 percent channers, 5 percent flagstones, and 5 percent stones

A—0 to 7 inches; dark yellowish brown (10YR 4/4), very gravelly loam, yellowish brown (10YR 5/4), dry; 20 percent clay; weak medium granular structure; friable, soft, nonsticky, nonplastic; few very fine and fine roots; common very fine interstitial pores; 20 percent gravel, 5 percent cobbles, and 10 percent channers; strong effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

C1—7 to 13 inches; brown (7.5YR 4/4), gravelly loam, reddish brown (5YR 5/4), dry; 24 percent clay; weak fine and medium subangular blocky structure; friable, soft, slightly sticky, nonplastic; common fine and few very fine and medium roots; few very fine and fine tubular pores; 15 percent gravel, 5 percent cobbles, and 5 percent stones; strong effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

C2—13 to 27 inches; reddish brown (2.5YR 5/3), very gravelly loam, light reddish brown (2.5YR 6/4), dry; 26 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few fine and medium roots; few very fine tubular pores; carbonate disseminated throughout; 25 percent gravel, 10 percent cobbles, and 5 percent stones; strong effervescence; strongly alkaline, pH 8.5; abrupt wavy boundary.

R—27 inches; Straight Cliffs Formation sandstone bedrock.

#### Range in Characteristics

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Surface fragments:* 10 to 20 percent gravel, 0 to 10 percent cobbles, 10 to 20 percent channers, 0 to 10 percent flagstones, and 0 to 10 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 75 percent gravel, cobbles, channers, and stones

## A horizon:

*Hue:* 7.5YR or 10YR*Value:* 5 to 7 dry; 4 to 6 moist*Chroma:* 4 or 5, dry or moist*Fragments:* 35 to 75 percent gravel, cobbles, channers, stones, and occasionally flagstones

## C horizons:

*Hue:* 2.5YR to 10YR*Value:* 5 to 7 dry; 4 to 6 moist*Chroma:* 4 or 5 dry, 3 or 4 moist*Texture:* gravelly loam, very gravelly loam*Clay content:* 18 to 27 percent*Fragments:* 10 to 30 percent gravel, 0 to 15 percent cobbles, and 0 to 10 percent stones**Tenneycanyon Series****Setting***Depth class:* deep to very deep*Drainage class:* excessively drained*Slowest permeability:* 6.0 to 20 in/hr (rapid)*Landform:* sand sheets on structural benches and hillslopes*Parent material:* eolian sand, residuum*Elevation:* 5,550 to 6,500 feet (1,692 to 1,981 meters)*Slope:* 2 to 15 percent*Climatic data:**Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)*Frost-free period:* 100 to 120 days**Taxonomic class**

Mesic, coated Lamellic Ustic Quartzipsamments

**Typical Pedon***Location in survey area:* latitude 37 degrees, 9 minutes, 30.85 seconds north; longitude 112 degrees, 18 minutes, 58.52 seconds west; datum: NAD 83*Surface fragments:* 5 percent gravel

A—0 to 3 inches; dark yellowish brown (10YR 4/4), fine sand, light brown (7.5YR 6/4), dry; 2 percent clay; weak fine subangular blocky parting to single grain; very friable, soft, nonsticky, nonplastic; common very fine, fine, and medium and few coarse roots; many very fine tubular pores; noneffervescent; neutral, pH 7.2; clear wavy boundary.

Bw1—3 to 15 inches; brown (7.5YR 4/4), loamy fine sand, yellowish brown (10YR 5/6), dry; 5 percent

clay; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; common very fine, fine, and medium and few coarse roots; many very fine interstitial and few fine tubular pores; noneffervescent; neutral, pH 7.2; abrupt wavy boundary.

Bw2—15 to 29 inches; strong brown (7.5YR 5/6) gravelly loamy fine sand, reddish yellow (7.5YR 6/6), dry; 4 percent clay; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; common very fine and few fine, medium, and coarse roots; many very fine interstitial and few fine tubular pores; 15 percent gravel; noneffervescent; neutral, pH 7.2; clear wavy boundary.

E—29 to 52 inches; yellowish brown (10YR 5/8), fine sand, brownish yellow (10YR 6/6), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; common very fine and few fine, medium, and coarse roots; many very fine interstitial and few fine tubular pores; 2 percent gravel; noneffervescent; slightly alkaline, pH 7.4; abrupt wavy boundary.

E/Bt—52 to 60 inches; yellowish brown (10YR 5/8) fine sand, brownish yellow (10YR 6/6), dry; 4 percent clay; single grain; loose, loose, nonsticky, nonplastic; 30 percent, 2 to 20 millimeter thick lamellae of strong brown (7.5YR 5/8), moist, loamy fine sand; weak fine subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; common very fine and few fine, medium, and coarse roots; many very fine interstitial and common very fine tubular pores; 5 percent gravel; noneffervescent; slightly alkaline, pH 7.6; abrupt wavy boundary.

C—60 to 65 inches; yellowish brown (10YR 5/6), gravelly fine sand, yellow (10YR 7/6), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; 20 percent gravel and paragravel; slight effervescence; slightly alkaline, pH 7.7; abrupt wavy boundary.

R—65 inches; Navajo Formation sandstone bedrock.

**Range in Characteristics***Depth to diagnostic feature:* 40 to 60 inches to lamellae*Depth to bedrock:* 40 to >60 inches (lithic)*Surface fragments:* 0 to 10 percent gravel*Particle-size control section (weighted average):**Clay content:* 3 to 10 percent*Rock fragment content:* 0 to 25 percent gravel

## A horizon:

*Hue:* 7.5YR or 10YR*Value:* 4 to 6 dry; 4 or 5 moist

*Chroma:* 3 to 6, dry or moist

**Bw horizons:**

*Hue:* 7.5YR or 10YR

*Value:* 5 to 7 dry; 4 to 6 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* fine sand to loamy fine sand, with appropriate modifier

*Fragments:* 0 to 20 percent gravel

**E and E/Bt horizons:**

*Hue:* 5YR to 10YR

*Value:* 4 to 6 dry; 4 or 5 moist

*Chroma:* 4 to 8, dry or moist

*Clay content:* 1 to 10 percent

*Fragments:* 2 to 10 percent gravel

**C horizon:**

*Hue:* 7.5YR or 10YR

*Value:* 5 to 8 dry; 5 to 7 moist

*Chroma:* 4 to 6, dry or moist

*Fragments:* 15 to 25 percent gravel

## Timpoweap Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* dipslope of cuesta, structural bench

*Parent material:* residuum

*Elevation:* 5,700 to 6,300 feet (1,737 to 1,920 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, mesic Lithic Haplustalfs

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 3 minutes, 21.52 seconds north; longitude 112 degrees, 5 minutes, 46.17 seconds west; datum: NAD 83

*Surface fragments:* 55 percent gravel and 10 percent cobbles

A—0 to 5 inches; dark brown (7.5YR 3/4), gravelly fine sandy loam, strong brown (7.5YR 4/6), dry; 13

percent clay; weak fine granular structure; very friable, soft, nonsticky, nonplastic; common very fine and fine and few medium roots; common very fine vesicular and tubular pores; 20 percent gravel and 5 percent cobbles; noneffervescent; neutral, pH 7.2; clear wavy boundary.

Bt—5 to 13 inches; yellowish red (5YR 4/6), very cobbly clay loam, light reddish brown (5YR 6/4), dry; 28 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few fine, medium, and coarse roots; common very fine irregular and few fine tubular pores; common thin clay films on ped faces, 2mm-thick carbonates coatings on the undersides of rock fragments; 20 percent gravel and 25 percent cobbles; slight effervescence; slightly alkaline, pH 7.4; abrupt wavy boundary.

R—13 inches; Moenkopi Formation limestone bedrock.

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Depth to diagnostic feature:* 4 to 10 inches to argillic horizon

*Surface fragments:* 50 to 60 percent gravel and 5 to 15 percent cobbles

*Particle-size control section (weighted average):*

*Clay content:* 18 to 30 percent

*Rock fragment content:* 30 to 50 percent gravel and cobbles

**A horizon:**

*Hue:* 7.5YR or 5YR

*Value:* 4 to 7 dry; 3 to 5 moist

*Chroma:* 2 to 6, dry or moist

*Fragments:* 15 to 25 percent gravel and cobbles

**Bt horizon:**

*Hue:* 7.5YR or 5YR

*Value:* 4 to 6 dry; 3 to 6 moist

*Chroma:* 3 to 6, dry or moist

*Clay content:* 18 to 30 percent

*Texture:* loam, sandy clay loam, clay loam

*Fragments:* 15 to 25 percent gravel and 20 to 30 percent cobbles

## Trail Series

### Setting

*Depth class:* very deep

*Drainage class:* somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Landform:* channel and valley flat

*Parent material:* mixed alluvium

*Elevation:* 3,800 to 4,700 feet (1,159 to 1,433 meters)  
*Slope:* 0 to 5 percent

**Climatic data:**

*Mean annual precipitation:* 6 to 9 inches (152 to 229 millimeters)  
*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)  
*Frost-free period:* 160 to 190 days

**Taxonomic class**

Sandy, mixed, mesic Typic Torrifluvents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 27 minutes, 3.00 seconds north; longitude 111 degrees, 9 minutes, 50.00 seconds west; datum: NAD 83

A—0 to 12 inches; reddish brown (5YR 4/4), loamy fine sand, reddish brown (5YR 5/4), dry; 2 percent clay; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine and fine roots; common very fine interstitial and few fine tubular pores; slight effervescence; moderately alkaline, pH 7.9; clear smooth boundary.

C1—12 to 29 inches; reddish brown (5YR 4/4), loamy sand, pinkish gray (5YR 6/2), dry; 2 percent clay; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; slight effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

C2—29 to 46 inches; brown (7.5YR 4/4), loamy sand, light brown (7.5YR 6/4), dry; 2 percent clay; weak fine and medium subangular blocky structure; very friable, soft, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; slight effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

C3—46 to 60 inches; reddish brown (5YR 5/4), sand, reddish yellow (5YR 6/6), dry; 2 percent clay; single grain; loose, loose, nonsticky, nonplastic; many very fine interstitial pores; slight effervescence; moderately alkaline, pH 8.1.

**Range in Characteristics**

*Particle-size control section (weighted average):*  
*Clay content:* 1 to 5 percent

**A horizons:**

*Hue:* 5YR to 10YR  
*Value:* 5 or 6 dry; 4 or 5 moist  
*Chroma:* 2 to 4 dry; 3 or 4 moist

**C horizons:**

*Hue:* 5YR to 10YR  
*Value:* 4 or 5 moist  
*Chroma:* 2 to 6 dry; 2 to 4 moist  
*Texture:* loamy sand, fine sand, loamy fine sand, sand

**Tsaya Series**

**Setting**

*Local phase:* saline

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* hillslopes on structural benches, ledges on escarpments

*Parent material:* slope alluvium, residuum

*Elevation:* 4,300 to 5,700 feet (1,311 to 1,738 meters)

*Slope:* 5 to 65 percent

**Climatic data:**

*Mean annual precipitation:* 6 to 9 inches (152 to 279 millimeters)

*Mean annual air temperature:* 52 to 57 degrees F. (11.0 to 14.0 degrees C.)

*Frost-free period:* 160 to 190 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Torriorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 31 minutes, 58.80 seconds north; longitude 111 degrees, 12 minutes, 0.70 seconds west; datum: NAD 83

*Surface fragments:* 5 percent cobbles and 50 percent channers

A—0 to 3 inches; dark reddish brown (2.5YR 3/4), channery loam, dark reddish brown (2.5YR 3/4), dry; 22 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; few very fine roots; common fine interstitial pores; 20 percent channers; slight effervescence; moderately alkaline, pH 8.0; clear smooth boundary.

C1—3 to 6 inches; dark reddish brown (2.5YR 3/4), very channery loam, reddish brown (2.5YR 4/4), dry; 23 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky,

slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; 40 percent channers and 15 percent flagstones; slight effervescence; moderately alkaline, pH 8.1; clear smooth boundary.

C2—6 to 9 inches; dark reddish brown (2.5YR 3/4), very channery loam, reddish brown (2.5YR 4/4), dry; 23 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine roots; few very fine and fine tubular pores; 40 percent channers and 15 percent flagstones; slight effervescence; moderately alkaline, pH 8.2; abrupt smooth boundary.

R—9 inches; Carmel Formation siltstone and mudstone bedrock

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 5 to 20 percent gravel, 0 to 15 percent cobbles, 10 to 65 percent channers, 5 to 15 percent flagstones, 10 to 20 percent stones, and 5 to 15 percent boulders

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 70 percent gravel, cobbles, channers, flagstones, stones, and boulders

A horizon:

*Hue:* 2.5YR to 10YR

*Value:* 3 to 6 dry; 3 or 4 moist

*Chroma:* 4 to 6, dry or moist

*Fragments:* 0 to 10 percent gravel, 0 to 15 percent cobbles, 0 to 35 percent channers, 0 to 20 percent stones, and 0 to 10 percent boulders

C horizons:

*Hue:* 2.5YR to 7.5YR

*Value:* 4 or 5 dry; 3 or 4 moist

*Chroma:* 4 to 6, dry or moist

*Clay content:* 18 to 27 percent

*Texture:* extremely channery loam, very cobbly loam, very channery loam

*Fragments:* 0 to 20 percent gravel, 5 to 20 percent cobbles, 10 to 50 percent channers, 5 to 20 percent flagstones, 5 to 15 percent stones, 10 to 20 percent boulders

*Calcium carbonate equivalent:* 1 to 15 percent

## Upler Series

### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* remnant stream terrace and hillslopes

*Parent material:* alluvium

*Elevation:* 6,000 to 7,160 feet (1,829 to 2,183 meters)

*Slope:* 1 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, mesic Aridic Calcustepts

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 31 minutes, 11.47 seconds north; longitude 112 degrees, 5 minutes, 41.40 seconds west; datum: NAD 83

*Surface fragments:* 35 percent gravel and 12 percent cobbles

A—0 to 3 inches; brown (7.5YR 4/4), very gravelly sandy loam, brown (7.5YR 5/4), dry; 12 percent clay; weak fine subangular blocky structure; friable, soft, slightly sticky, slightly plastic; common fine and few fine roots; many very fine and fine tubular pores; 36 percent gravel; slight effervescence; moderately alkaline, pH 8.0; abrupt smooth boundary.

Bw—3 to 9 inches; brown (7.5YR 4/4), gravelly loam, light brown (7.5YR 6/4), dry; 25 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine and many fine roots; many very fine and fine tubular pores; 30 percent gravel; slight effervescence; calcium carbonate is disseminated throughout; moderately alkaline, pH 8.2; abrupt smooth boundary.

Bk1—9 to 25 inches; yellowish brown (10YR 5/4), extremely gravelly sandy loam, very pale brown

(10YR 7/4), dry; 12 percent clay; massive; very friable, soft, slightly sticky, slightly plastic; few very fine and fine roots; many very fine and fine interstitial pores; 60 percent gravel and 5 percent cobbles; calcium carbonate is disseminated throughout and carbonate coats are on rock faces; strong effervescence; moderately alkaline, pH 8.4; clear wavy boundary.

Bk2—25 to 35 inches; light yellowish brown (10YR 6/4), extremely gravelly loamy sand, very pale brown (10YR 7/4), dry; 9 percent clay; massive; loose, loose, nonsticky, nonplastic; few very fine and fine roots; calcium carbonate is disseminated throughout and carbonate coats are on rock faces; 60 percent gravel and 5 percent cobbles; strong effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

Bk3—35 to 60 inches; reddish yellow (7.5YR 6/6), extremely gravelly loam, pink (7.5YR 7/4), dry; 20 percent clay; massive; loose, loose, slightly sticky, slightly plastic; few very fine and fine roots; 60 percent gravel and 5 percent cobbles; calcium carbonate is disseminated throughout and carbonate coats are on rock fragments; slight effervescence; moderately alkaline, pH 8.2.

#### Range in Characteristics

*Depth to diagnostic feature:* 5 to 26 inches to secondary carbonates; 3 to 9 inches to cambic horizon

*Surface fragments:* 12 to 65 percent gravel, cobbles, and stones

*Particle-size control section (weighted average):*

*Clay content:* 15 to 25 percent

*Rock fragment content:* 30 to 65 percent gravel, cobbles, and stones

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 4 to 7 dry; 3 or 4 moist

*Chroma:* 3 or 4, dry or moist

*Fragments:* 15 to 50 percent gravel and cobbles

Bw horizons:

*Hue:* 7.5YR or 10YR

*Value:* 4 to 6 dry; 3 or 4 moist

*Chroma:* 3 or 4, dry or moist

*Texture:* stony loam, gravelly loam

*Fragments:* 15 to 35 percent gravel and cobbles

Bk and Btk horizons:

*Hue:* 7.5YR or 10YR

*Value:* 6 or 7 dry; 3 to 6 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* extremely gravelly sandy loam, extremely

gravelly loamy sand, extremely gravelly loam, very stony loam

*Fragments:* 35 to 65 percent gravel, cobbles, and stones

*Calcium carbonate equivalent:* 15 to 30 percent

## Vessilla Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Landform:* structural bench, escarpments

*Parent material:* eolian sand, sandstone residuum

*Elevation:* 5,250 to 7,900 feet (1,600 to 2,409 meters)

*Slope:* 2 to 65 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Loamy, mixed, active, calcareous, mesic Aridic Lithic Ustorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 31 minutes, 53.06 seconds north; longitude 111 degrees, 33 minutes, 13.95 seconds west; datum: NAD 83

*Surface fragments:* 15 percent gravel and 5 percent stones

A—0 to 2 inches; brown (10YR 4/3), gravelly loamy sand, yellowish brown (10YR 5/4), dry; 8 percent clay; weak very fine granular structure; 15 percent gravel; very slight effervescence; slightly alkaline, pH 7.4.

C—2 to 8 inches; brown (10YR 4/3), gravelly sandy loam, yellowish brown (10YR 5/4), dry; 12 percent clay; weak fine subangular blocky structure; 15 percent gravel, 5 percent channers and 5 percent stones; strong effervescence; moderately alkaline, pH 8.0.

R—8 inches; Straight Cliffs Formation sandstone bedrock

### Range in Characteristics

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Surface fragments:* 0 to 20 percent gravel, 0 to 50 percent channers, 0 to 10 percent flagstones, and 0 to 10 percent stones;

*Particle-size control section (weighted average):*  
*Clay content:* 10 to 20 percent

A horizon:

*Hue:* 7.5YR or 10YR

*Value:* 4 to 7 dry; 3 to 6 moist

*Chroma:* 3 to 6 moist

*Fragments:* 0 to 20 percent gravel

C horizons:

*Hue:* 7.5YR or 10YR

*Value:* 4 to 7 dry; 3 to 6 moist

*Chroma:* 3 to 6 moist

*Texture:* gravelly fine sandy loam, gravelly sandy loam, sandy loam, fine sandy loam, loam

*Fragments:* 0 to 20 percent gravel, 0 to 10 percent cobbles, 0 to 10 percent channers, and 0 to 10 percent stones

## Wayneco Series

### Setting

*Depth class:* shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderately rapid)

*Landform:* structural bench

*Parent material:* siltstone and sandstone residuum

*Elevation:* 5,000 to 5,600 feet (1,524 to 1,707 meters)

*Slope:* 2 to 15 percent

*Climatic data:*

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)

*Frost-free period:* 120 to 160 days

### Taxonomic class

Loamy, mixed, superactive, mesic Lithic Ustic Haplocalcids

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 34 minutes, 17.96 seconds north; longitude 111 degrees, 15 minutes, 5.94 seconds west; datum: NAD 83

A—0 to 5 inches; reddish brown (5YR 4/4), sandy loam, reddish brown (5YR 5/4), dry; 8 percent clay; single grain; loose, loose, nonsticky, nonplastic; few very fine, fine, and medium roots; 5 percent

channers; very slight effervescence; moderately alkaline, pH 8.2; clear smooth boundary.

Bk—5 to 19 inches; yellowish brown (5YR 4/6), channery loam, yellowish red (5YR 5/6), dry; 17 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine, fine, and medium and common coarse roots; few very fine and fine pores; 30 percent carbonate coats on all faces of peds; 15 percent channers; strong effervescence; moderately alkaline, pH 8.4.

R—19 inches; Carmel Formation siltstone bedrock

### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Depth to secondary carbonates:* 3 to 10 inches

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

A horizon:

*Fragments:* 0 to 10 percent channers

Bk horizon:

*Clay content:* 8 to 18 percent

*Fragments:* 0 to 15 percent gravel and 10 to 20 percent channers

*Calcium carbonate equivalent:* 15 to 30 percent

## Widtsoe Series

### Setting

*Depth class:* very deep

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* remnant stream terraces, alluvial fans

*Parent material:* mixed alluvium

*Elevation:* 7,500 to 8,300 feet (2,286 to 2,530 meters)

*Slope:* 2 to 25 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, frigid Calcic Argiustolls

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 36

minutes, 38.99 seconds north; longitude 111 degrees, 51 minutes, 40.77 seconds west; datum: NAD 83

*Surface fragments:* 0 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

A—0 to 10 inches; dark brown (7.5YR 3/3), gravelly sandy loam, brown (7.5YR 5/3), dry; 16 percent clay; weak medium and coarse granular parting to weak fine granular structure; very friable, soft, nonsticky, nonplastic; many very fine and fine, common medium and few coarse and very coarse roots; many very fine and fine and few medium dendritic tubular pores; 25 percent gravel and 2 percent cobbles; very slight effervescence slightly alkaline, pH 7.6; clear smooth boundary.

Bt—10 to 20 inches; brown (7.5YR 4/4), extremely cobbly loam, brown (7.5YR 5/4), dry; 25 percent clay; massive; firm, hard, slightly sticky, slightly plastic; common very fine and fine and few medium, coarse and very coarse roots; many very fine and fine and few medium dendritic tubular pores; 35 percent prominent clay films on all faces of peds; 45 percent gravel and 25 percent cobbles; very slight effervescence; neutral, pH 7.2; clear wavy boundary.

2Bk1—20 to 52 inches; brown (7.5YR 5/3), very gravelly loamy sand, pinkish gray (7.5YR 7/2), dry; 11 percent clay; massive; friable, moderately hard, nonsticky, nonplastic; few fine, medium, coarse and very coarse roots; few medium and coarse tubular pores; 10 percent fine distinct irregular carbonate nodules throughout matrix, 25 percent fine distinct irregular carbonate masses throughout matrix, prominent carbonate coats on 95 percent of rock fragments; 50 percent gravel and 10 percent cobbles; violent effervescence; moderately alkaline, pH 8.2; clear wavy boundary.

2Bk2—52 to 63 inches; 50 percent brown (7.5YR 5/2), very gravelly loamy sand, pinkish gray (7.5YR 7/2), dry; 50 percent brown (10YR 5/3), very pale brown (10YR 7/3) dry; 11 percent clay; single grain; loose, soft, nonsticky, nonplastic; common fine interstitial pores; 6 percent fine distinct irregular carbonate nodules throughout matrix, 6 percent fine distinct irregular carbonate masses throughout matrix, prominent carbonate coats on 95 percent of rock fragments; 45 percent gravel and 5 percent cobbles; strong effervescence; slightly alkaline, pH 7.4.

#### Range in Characteristics

*Depth to secondary carbonates:* 14 to 24 inches

*Depth to diagnostic feature:* argillic horizon 5 to 15 inches

*Surface fragments:* 0 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 75 percent gravel, cobbles, and stones

A horizon:

*Hue:* 7.5YR or 10YR

*Chroma:* 2 or 3, dry or moist

*Fragments:* 5 to 30 percent, gravel, 0 to 15 percent cobbles, and 0 to 25 percent stones

Bt horizons:

*Hue:* 7.5YR or 10YR

*Chroma:* 3 or 4, dry or moist

*Texture:* extremely cobbly loam, very stony clay loam

*Clay content:* 25 to 35 percent

*Fragments:* 10 to 50 percent gravel, 5 to 30 percent cobbles, and 0 to 20 percent stones

Bk and 2Bk horizons:

*Hue:* 7.5YR or 10YR

*Value:* 4 to 6 moist

*Chroma:* 2 to 4, dry or moist

*Texture:* very gravelly loamy sand, very stony loam, very stony clay loam

*Fragments:* 10 to 55 percent gravel, 5 to 15 percent cobbles, and 0 to 20 percent stones

*Calcium carbonate equivalent:* 15 to 30 percent

## Wiggler Series

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* mountain slope

*Parent material:* colluvium, residuum

*Elevation:* 7,800 to 8,200 feet (2,377 to 2,499 meters)

*Slope:* 25 to 65 percent

*Climatic data:*

*Mean annual precipitation:* 16 to 20 inches (406 to 508 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

### Taxonomic class

Loamy, mixed, superactive, calcareous, frigid, shallow  
Typic Ustorthents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 34 minutes, 53.00 seconds north; longitude 111 degrees, 49 minutes, 59.00 seconds west; datum: NAD 83

*Surface fragments:* 15 percent gravel, 20 percent cobbles, and 10 percent stones

A—0 to 3 inches; olive brown (2.5Y 4/3), moist, very bouldery loam, light olive brown (2.5Y 5/3), dry; 22 percent clay; weak medium granular structure; 10 percent gravel, 15 percent cobbles, 15 percent stones, and 10 percent boulders; slight effervescence; moderately alkaline, pH 8.0.

C—3 to 14 inches; light olive brown (2.5Y 5/3), moist, loam, light yellowish brown (2.5Y 6/3), dry; 24 percent clay; weak fine granular structure; strong effervescence; moderately alkaline, pH 8.2.

Cr—14 inches; soft calcareous bedrock.

**Range in Characteristics**

*Depth to restrictive feature:* 4 to 20 inches to bedrock (paralithic)

*Surface fragments:* 0 to 45 percent gravel, cobbles, and stones

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 0 to 35 percent gravel, cobbles, and stones

A horizon:

*Fragments:* 0 to 50 percent, gravel, cobbles, stones, and an occasional boulder

**Winetti Series****Setting**

*Depth class:* very deep

*Drainage class:* moderately well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* drainageway

*Parent material:* alluvium from sandstone and limestone

*Elevation:* 6,560 to 6,890 feet (2,000 to 2,100 meters)

*Slope:* 2 to 5 percent

*Climatic data:*

*Mean annual precipitation:* 16 to 20 inches (406 to 508 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, calcareous, frigid Typic Ustifluvents

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 25 minutes, 30.00 seconds north; longitude 112 degrees, 12 minutes, 39.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 2 percent cobbles, and 3 percent stones

A—0 to 6 inches; dark brown (7.5YR 3/4), gravelly loam, brown (7.5YR 4/4), dry; 19 percent clay; weak fine and medium granular structure; 10 percent gravel and 5 percent cobbles; no effervescence; slightly alkaline, pH 7.6.

C1—6 to 17 inches; brown (7.5YR 4/3), gravelly loam, brown (7.5YR 5/3), dry; 22 percent clay; weak medium and fine subangular blocky structure; 10 percent gravel and 5 percent cobbles; slight effervescence; moderately alkaline, pH 8.2.

C2—17 to 60 inches; brown (7.5YR 5/4), very cobbly sandy loam, light brown (7.5YR 6/4), dry; 10 percent clay; weak fine granular structure; 15 percent gravel and 25 percent cobbles; strong effervescence; moderately alkaline, pH 8.2.

**Range in Characteristics**

*Surface fragments:* 0 to 10 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 8 to 18 percent

*Rock fragment content:* 35 to 50 percent gravel, cobbles, and stones

A horizons:

*Fragments:* 9 to 15 percent gravel and 3 to 10 percent cobbles

C horizons:

*Value:* 4 or 5 moist

*Chroma:* 3 or 4, dry or moist

*Texture:* very cobbly sandy loam, gravelly loam

*Fragments:* 10 to 20 percent gravel, and 5 to 30 percent cobbles

**Yarts Series****Setting**

*Local phases:* eroded, moist

*Depth class:* very deep

*Drainage class:* well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Landform:* plains and interdunes on structural benches, stream terraces  
*Parent material:* eolian sand, alluvium  
*Elevation:* 4,300 to 6,460 feet (1,311 to 1,970 meters)  
*Slope:* 2 to 40 percent

**Climatic data:**

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)  
*Mean annual air temperature:* 45 to 52 degrees F. (7.0 to 11.0 degrees C.)  
*Frost-free period:* 120 to 160 days

**Taxonomic class**

Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

**Typical Pedon**

*Location in survey area:* 37 degrees, 32 minutes, 26.00 seconds north; longitude 112 degrees, 4 minutes, 13.00 seconds west; datum: NAD 83

A—0 to 10 inches; brown (7.5YR 4/4), sandy loam, light brown (7.5YR 6/4), dry; 15 percent clay; weak fine granular structure; very friable, soft, slightly sticky, slightly plastic; common fine and medium roots; few fine and medium pores; slight effervescence; moderately alkaline, pH 8.3; gradual wavy boundary.

C—10 to 60 inches; reddish brown (5YR 5/4), fine sandy loam, light reddish brown (5YR 6/4), dry; 14 percent clay; massive; very friable, soft, slightly sticky, slightly plastic; few fine and medium roots; few fine and medium pores; slight effervescence; moderately alkaline, pH 8.0.

**Range in Characteristics**

*Surface fragments:* 0 to 5 percent gravel  
*Particle-size control section (weighted average):*  
*Clay content:* 8 to 18 percent

**A horizons:**

*Hue:* 5YR or 7.5YR  
*Value:* 5 or 6 dry  
*Chroma:* 4 to 6 dry; 3 to 6 moist

**C horizons:**

*Hue:* 5YR or 7.5YR  
*Value:* 4 to 6 dry; 4 or 5 moist  
*Chroma:* 4 to 6 dry or moist  
*Texture:* fine sandy loam, loam, very fine sandy loam, gravelly very fine sandy loam  
*Fragments:* 0 to 15 percent gravel

**Yatne Series****Setting**

*Depth class:* very deep  
*Drainage class:* well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Landform:* landslide on escarpments and hillslopes  
*Parent material:* colluvium, slope alluvium  
*Elevation:* 6,000 to 7,000 feet (1,829 to 2,134 meters)  
*Slope:* 15 to 50 percent

**Climatic data:**

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)  
*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)  
*Frost-free period:* 100 to 120 days

**Taxonomic class**

Loamy-skeletal, mixed, superactive, mesic Aridic Calciustepts

**Typical Pedon**

*Location in survey area:* latitude 37 degrees, 28 minutes, 17.00 seconds north; longitude 111 degrees, 32 minutes, 36.00 seconds west; datum: NAD 83

*Surface fragments:* 10 percent gravel, 10 percent cobbles, 15 percent stones, and 15 percent boulders

A—0 to 6 inches; dark yellowish brown (10YR 4/4), very bouldery loam, yellowish brown (10YR 5/4), dry; 23 percent clay; weak fine and medium granular structure; friable, soft, slightly sticky, nonplastic; common fine and few very fine and medium roots; few fine tubular and common very fine interstitial pores; 10 percent gravel, 15 percent stones, and 10 percent boulders; slight effervescence; moderately alkaline, pH 8.3; clear wavy boundary.

Bw—6 to 15 inches; brown (10YR 5/3), very stony loam, light brownish gray (10YR 6/2), dry; 26 percent clay; weak fine and medium subangular blocky structure; firm, slightly hard, slightly sticky, nonplastic; common fine and few very fine and medium roots; few fine tubular and few very fine interstitial pores; secondary calcium carbonate disseminated throughout; 15 percent gravel, 10 percent cobbles, and 10 percent stones; slight effervescence; moderately alkaline, pH 8.4; gradual wavy boundary.

Bk1—15 to 27 inches; yellowish brown (10YR 5/4), very stony loam, pale brown (10YR 6/3), dry; 25 percent clay; moderate fine and medium subangular blocky structure; firm, hard, slightly sticky, slightly plastic; few fine and medium and common very fine roots; common very fine interstitial pores; secondary calcium carbonate disseminated throughout; 20 percent gravel, 10 percent cobbles, and 10 percent stones; strong effervescence; moderately alkaline, pH 8.2; gradual irregular boundary.

Bk2—27 to 37 inches; pale brown (10YR 6/3), cobbly loam, light gray (10YR 7/2), dry; 25 percent clay; weak medium subangular blocky structure; firm, hard, slightly sticky, slightly plastic; few very fine and fine roots; common very fine interstitial pores; secondary calcium carbonate segregated as many medium soft masses; 15 percent gravel, 10 percent cobbles, and 5 percent stones; strong effervescence; strongly alkaline, pH 8.5; gradual irregular boundary.

2C1—37 to 45 inches; yellowish brown (10YR 5/4), cobbly clay loam, light yellowish brown (10YR 6/4), dry; 28 percent clay; weak fine and medium subangular blocky structure; very firm, hard, slightly sticky, slightly plastic; few fine roots; few very fine tubular pores; 10 percent gravel, 10 percent cobbles, and 5 percent stones; slight effervescence; moderately alkaline, pH 8.3; gradual wavy boundary.

2C2—45 to 60 inches; yellowish brown (10YR 5/4), very stony loam, light yellowish brown (10YR 6/4), dry; 26 percent clay; massive; very firm, very hard, slightly sticky, slightly plastic; few very fine tubular pores; secondary calcium carbonate coatings on surfaces along pores; 10 percent gravel, 20 percent cobbles, and 25 percent stones; slight effervescence; moderately alkaline, pH 8.3.

#### Range in Characteristics

*Surface fragments:* 5 to 15 percent gravel, 5 to 15 percent cobbles, 10 to 20 percent stones, and 10 to 20 percent boulders

*Depth to calcic horizon:* 6 to 15 inches

*Particle-size control section (weighted average):*

*Clay content:* 18 to 27 percent

*Rock fragment content:* 35 to 60 percent, gravel, cobbles, stones, and boulders

A horizon:

*Hue:* 10YR or 2.5Y

*Value:* 4 to 6 dry; 3 to 5 moist

*Chroma:* 3 or 4, dry or moist

*Fragments:* 15 to 50 percent gravel, cobbles, stones, and boulders

Bw and Bk horizons:

*Hue:* 10YR or 2.5Y

*Value:* 4 to 7 dry; 3 to 6 moist

*Chroma:* 2 to 4 dry; 3 or 4 moist

*Texture:* stony loam, cobbly loam

*Fragments:* 10 to 25 percent gravel, 5 to 15 percent cobbles, and 0 to 15 percent stones

*Calcium carbonate equivalent:* 15 to 30 percent

2C horizons:

*Hue:* 10YR or 2.5Y

*Value:* 5 or 6 dry; 4 or 5 moist

*Chroma:* 3 to 6, dry or moist

*Texture:* cobbly clay loam, very stony loam

*Fragments:* 5 to 15 percent gravel, 5 to 25 percent cobbles, and 0 to 30 percent stones

## Zibetod Family

### Setting

*Depth class:* very shallow to shallow

*Drainage class:* well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Landform:* mountain slope, escarpment, structural bench

*Parent material:* residuum, colluvium

*Elevation:* 6,800 to 7,600 feet (2,073 to 2,317 meters)

*Slope:* 30 to 70 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 42 to 45 degrees F. (5.6 to 7.2 degrees C.)

*Frost-free period:* 70 to 90 days

### Taxonomic class

Loamy-skeletal, mixed, superactive, frigid Lithic Argiustolls

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 14 minutes, 33.10 seconds north; longitude 111 degrees, 4 minutes, 1.15 seconds west; datum: NAD 83

*Surface fragments:* 5 percent cobbles and 5 percent stones

A—0 to 4 inches; very dark grayish brown (10YR 3/2), loam, dark brown (10YR 3/3), dry; 22 percent clay;

weak fine and medium subangular blocky parting to weak fine granular structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine roots; few very fine tubular pores; 5 percent gravel; noneffervescent; slightly alkaline, pH 7.4; clear smooth boundary.

Bw—4 to 9 inches; very dark grayish brown (10YR 3/2), loam, dark brown (10YR 3/3), dry; 23 percent clay; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; many very fine and fine roots; few very fine and fine tubular pores; 5 percent gravel; noneffervescent; slightly alkaline, pH 7.4; clear smooth boundary.

Bt—9 to 18 inches; dark brown (10YR 3/3), very gravelly clay loam, brown (10YR 4/3), dry; 28 percent clay; moderate fine subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; common very fine and fine roots; common very fine, fine, and medium tubular pores; 35 percent gravel, 15 percent cobbles, and 5 percent stones; noneffervescent; slightly alkaline, pH 7.6; abrupt smooth boundary.

R—18 inches; Tropic Shale bedrock

#### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)

*Thickness of mollic epipedon:* 4 to 10 inches

*Surface fragments:* 0 to 10 percent cobbles and 0 to 10 percent stones

*Particle-size control section (weighted average):*

*Clay content:* 22 to 38 percent

A horizon:

*Fragments:* 0 to 10 percent gravel

Bt and Bw horizons:

*Value:* 3 or 4 dry; 3 moist

*Chroma:* 2 or 3, dry or moist

*Texture:* very gravelly clay loam, loam

*Clay content:* 20 to 40 percent

*Fragments:* 0 to 10 percent gravel, 0 to 20 percent cobbles, and 0 to 10 percent stones

## Zigzag Series

### Setting

*Depth class:* shallow

*Drainage class:* well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Landform:* escarpments, hillslopes

*Parent material:* shale residuum

*Elevation:* 6,260 to 7,060 feet (1,909 to 2,152 meters)

*Slope:* 15 to 50 percent

*Climatic data:*

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 45 to 51 degrees F. (7.0 to 10.5 degrees C.)

*Frost-free period:* 100 to 120 days

### Taxonomic class

Clayey, smectitic, calcareous, mesic, shallow Aridic Ustorthents

### Typical Pedon

*Location in survey area:* latitude 37 degrees, 22 minutes, 55.00 seconds north; longitude 112 degrees, 12 minutes, 50.00 seconds west; datum: NAD 83

A1—0 to 3 inches; dark grayish brown (2.5Y 4/2), clay loam, light olive brown (2.5Y 5/3), dry; 35 percent clay; weak fine granular structure; very friable, soft, very sticky, very plastic; few very fine roots; very slight effervescence; moderately alkaline, pH 8.4; abrupt smooth boundary.

A2—3 to 9 inches; dark grayish brown (2.5Y 4/2), clay, light brownish gray (2.5Y 6/2), dry; 45 percent clay; weak medium subangular blocky structure; firm, very hard, very sticky, very plastic; common very fine and few fine roots; very slight effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

C—9 to 14 inches; grayish brown (2.5Y 5/2), clay, light brownish gray (2.5Y 6/2), dry; 45 percent clay; massive; firm, very hard, very sticky, very plastic; few very fine and fine roots; yellowish brown (10YR 5/6) mottles; violent effervescence; moderately alkaline, pH 8.4; clear smooth boundary.

Cr1—14 to 30 inches; highly weathered Tropic Shale

Cr2—30; Tropic Shale bedrock

### Range in Characteristics

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Particle-size control section (weighted average):*

*Clay content:* 40 to 55 percent

A horizons:

*Value:* 5 or 6 dry

C horizons:

*Clay content:* 40 to 55 percent



# Physiography and Geology

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## Physiography

Suzann Kienast-Brown, soil scientist, Logan, Utah, prepared this section.

The Grand Staircase-Escalante National Monument (GSENM) covers approximately 1.8 million acres in the Canyonlands section of the Colorado Plateau in south-central Utah. This vast area encompasses three distinctly different physiographic regions: the Grand Staircase, the Kaiparowits Plateau, and the Escalante Canyons (fig. 2). The Grand Staircase region is on the western side of the GSENM and consists of alternating broad benches and vertical cliffs, creating a large-scale staircase. The Kaiparowits Plateau region is in the middle section of the GSENM and is made up of a broad plateau incised by several canyons. The Escalante Canyons region is on the eastern side of the GSENM and consists of a large expanse of land inundated by canyons of various sizes (Doelling et al., 2000).

The GSENM ranges in elevation from 4,000 ft (1,220 m) to 9,280 ft (2,828 m), resulting in three climatic zones: upland, semi-desert, and desert. Precipitation falls primarily at the higher elevations during the winter months and at lower elevations during the summer months. Vegetation ranges from Ponderosa Pine forest and Pinyon-Utah Juniper woodland in upland areas to sparse desert scrub and grasses in desert areas (Doelling et al., 2000).

## Structural Geology

### Grand Staircase Region

The Grand Staircase region is a northward-dipping homocline that exposes the oldest rocks to the south and the youngest rocks to the north. The strata of this homocline are cut by several normal faults, including the Paunsaugunt, Johnson Canyon, and Paria River faults. Major structural features include the Kaibab uplift, the Paria River syncline, the Hackberry Canyon syncline, and the East Kaibab monocline. The Kaibab uplift is expressed by Buckskin Mountain and is

synchronous with the Grand Canyon uplift in Arizona. The Kaibab uplift is also known as the Kaibab anticline, and it extends south to north across the GSENM. The East Kaibab monocline, known as the Cockscomb, is the eastern boundary of the Grand Staircase region of the GSENM. The vertical cliffs that create the risers of the staircase in the Grand Staircase region are, from south to north, the Chocolate Cliffs (Moenkopi and Shinarump Formations), the Vermillion Cliffs (Moenave and Kayenta Formations), the White Cliffs (Navajo Sandstone), the Gray Cliffs (Cretaceous sandstones), and the Pink Cliffs (Tertiary lake sediments). The rocks that create these cliffs range in age from Triassic (Chocolate Cliffs) to Tertiary (Pink Cliffs) (Doelling et al., 2000).

### Kaiparowits Plateau Region

Like the Grand Staircase region as a whole, the Kaiparowits Plateau dips gently northward. Cretaceous outcrops dominate the Kaiparowits Plateau because of displacement caused by the East Kaibab monocline, or the Cockscomb, which forms the western boundary of the Kaiparowits Plateau. The Cretaceous strata are composed of alternating hard and soft bedrock units, and are subdivisions of the strata that comprise the Gray Cliffs. The strata gradually rise with increasing distance eastward from the East Kaibab monocline and are truncated by erosion along Fiftymile Mountain, also known as the Straight Cliffs. The Straight Cliffs form the eastern boundary of the Kaiparowits Plateau. The major folds of the Kaiparowits Plateau are, from west to east, the Coyote Creek-Blue Wash-Table Cliff syncline, Tommy Canyon anticline, Wahweap syncline, Nipple Bench anticline, Warm Creek syncline, Smoky Mountain anticline, Last Chance syncline, Upper Valley anticline, Alvey Wash syncline, Rees Canyon anticline, and Croton syncline. As the plateau narrows to the north, the number of folds decreases.

### Escalante Canyons Region

Fiftymile Mountain, or the Straight Cliffs, is the boundary between the Kaiparowits Plateau and the

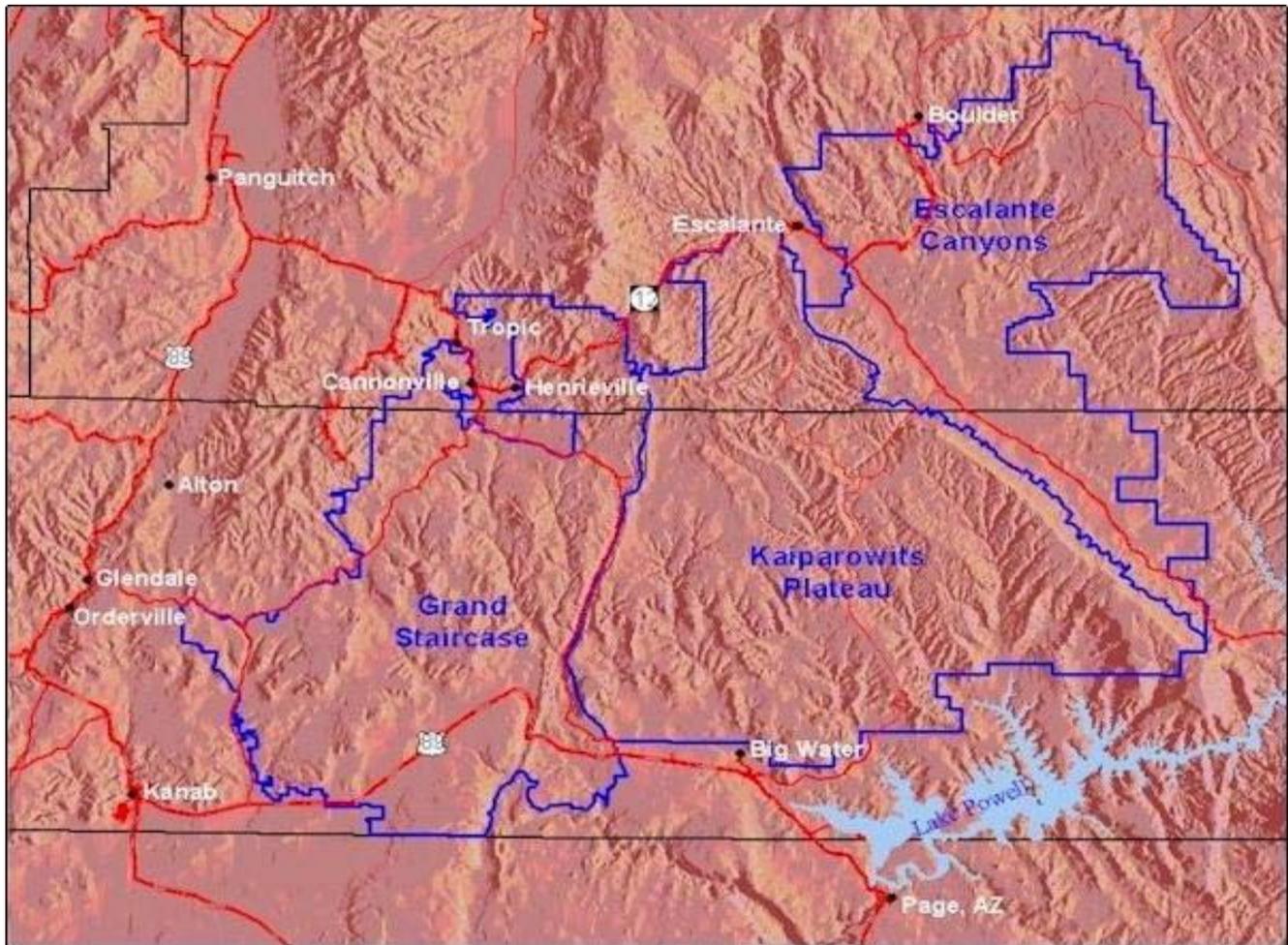


Figure 2.—Shaded relief map of the GSENM (outlined in blue) showing the three distinct physiographic regions. Originally on [http://www.ut.blm.gov/monument/Visitor\\_information/Maps/relief\\_map.html](http://www.ut.blm.gov/monument/Visitor_information/Maps/relief_map.html).

Escalante Canyons region. The Circle Cliffs uplift is the dominant structural feature of this section of the GSENM. The Circle Cliffs uplift has a southwest limb that extends gently northeast from Hole-in-the-Rock road to the axis of the uplift. Waterpocket Fold is the eastern boundary of the Circle Cliffs uplift and the GSENM. The Circle Cliffs uplift is a double-plunging anticline, exposing Permian and Triassic rocks at the apex (Stokes, 1988). The Escalante monocline dips to the west and is north of the town of Escalante. Synclines and anticlines superimposed on the southwest limb of the Circle Cliffs uplift include the Collet anticline, the Red Breaks syncline, the Hurricane Wash syncline, Bridge anticline, and Fiftymile Creek syncline. The Escalante River and its tributaries have cut the southwest limb of the Circle Cliffs uplift, forming deep canyons throughout the area.

## Stratigraphy

Rocks exposed in the GSENM span nearly 270 million years, ranging in age from Permian to Tertiary. (Figure 3 shows the progression of stratigraphic formations discussed in this section. Tertiary rocks are visible from the GSENM but do not fall within the GSENM boundary. The rocks currently exposed in the GSENM represent only 43 percent of the 270-million-year interval. The other 57 percent of the rock record was lost to erosion (Doelling et al., 2000).

## Permian Formations

The oldest rocks in the GSENM are Permian and are exposed in the Grand Staircase and Escalante Canyons regions. The Hermit Shale, Coconino

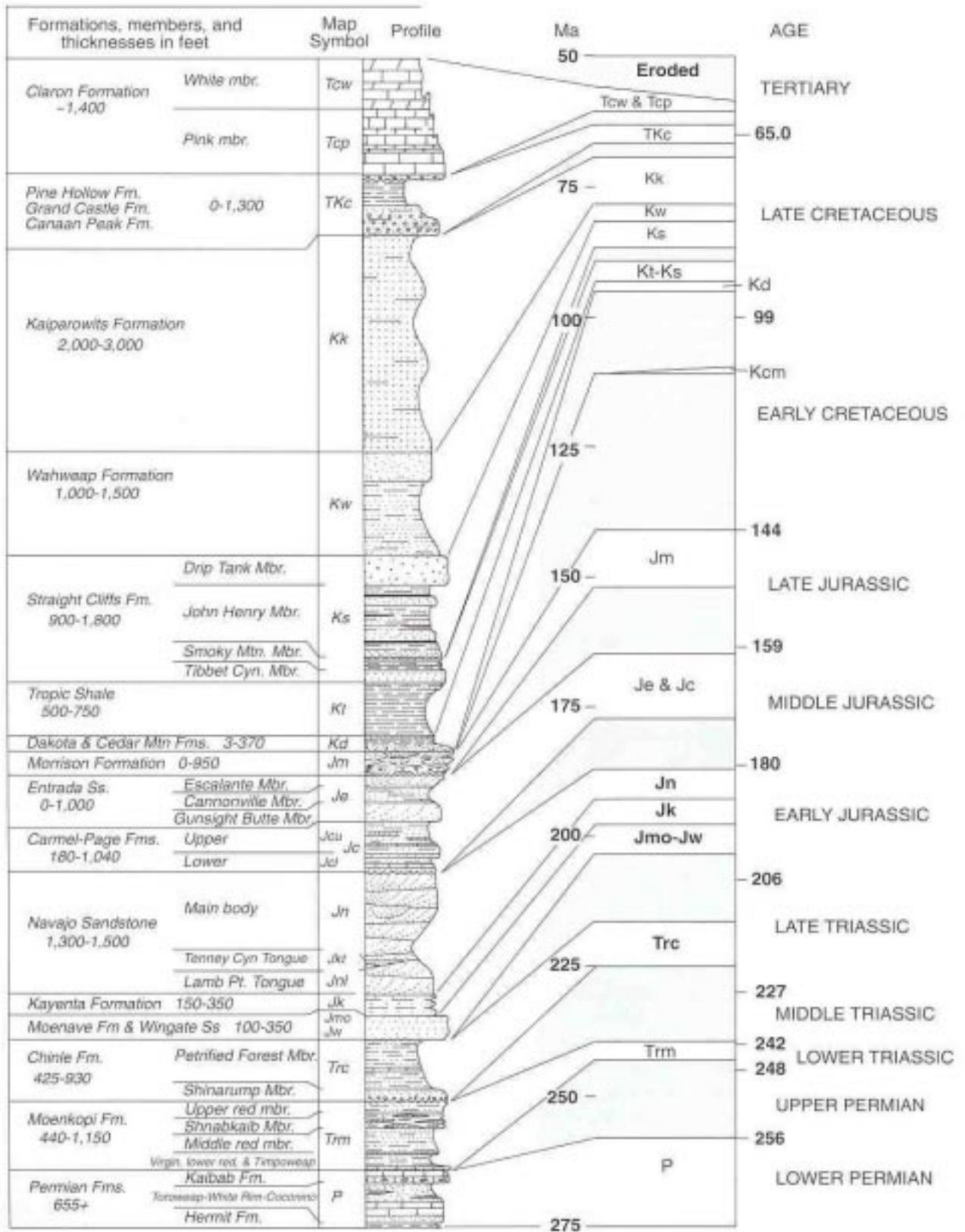


Figure 3. —Age, thickness, and names of formations and members of geologic units exposed in the GSENM (Doelling et al., 2000).

Sandstone, Toroweap Formation, and Kaibab Limestone are exposed in the Kaibab uplift of the Grand Staircase region and are approximately 600 feet thick. The White Rim Sandstone and Kaibab Limestone are exposed in the Circle Cliffs uplift of the Escalante Canyons region and are approximately 320 feet thick (Doelling, et al, 2000).

### Triassic Formations

The Moenkopi Formation ranges from 910 to 1,150 feet thick in the Grand Staircase region and includes the Timpoweap, Lower Red, Virgin Limestone, Middle Red, Shnabkaib, and Upper Red members. The Moenkopi Formation ranges from 440 to 730 feet thick in the Circle Cliffs area of the Escalante Canyons region and includes the Black Dragon, Sinbad, Torrey, and Moody Canyon members. The Grand Staircase region may not include a Black Dragon equivalent. The Timpoweap Member correlates with the Sinbad Member; and the Lower Red, Virgin Limestone, and Middle Red members correlate with the Torrey Member. The Shnabkaib and Upper Red members correlate with the Moody Canyon Member (Doelling et al., 2000).

The Chinle Formation is 500 to 930 feet thick in the Grand Staircase region and 425 to 750 feet thick in the Circle Cliffs area of the Escalante Canyons region. Several members of the Chinle formation are present in the GSENM, including the Temple Mountain, Shinarump, Monitor Butte, Moss Back, Petrified Forest, Owl Rock, and Church Rock Members. Not all members of the Chinle are present in each area of exposure. The lower Chinle members, Temple Mountain and Shinarump, form ledges. In contrast, the upper members, Monitor Butte, Moss Back, Petrified Forest, Owl Rock, and Church Rock, form slopes. The Chinle Formation is very heterogeneous, composed of varying amounts of lacustrine and fluvial interbedded sandstone, mudstone, claystone, siltstone, limestone, gritstone, and conglomerate (Doelling et al., 2000).

### Jurassic Formations

Lower, Middle, and Upper Jurassic rocks are present and quite extensive in the GSENM. Lower Jurassic rocks include the Wingate Sandstone-Moenave Formation, the Kayenta Formation, and Navajo Sandstone, commonly referred to as the Glen Canyon Group. Middle Jurassic rocks include the Page Sandstone, Carmel Formation, Entrada Sandstone,

Romana Mesa Sandstone, and Henrieville Sandstone, commonly referred to as the San Rafael Group. Upper Jurassic rocks include members of the Morrison Formation (Doelling et al., 2000).

The Wingate Sandstone is only present in the Escalante Canyons region and is approximately 350 feet thick. The Wingate Sandstone is the namesake of the Circle Cliffs area, forming vertical cliffs that surround the area in a circular fashion. The Moenave Formation, which is approximately 450 feet thick in the Grand Staircase region, is the equivalent of the Wingate Sandstone. The Kayenta Formation is dominantly a ledge-forming sandstone. It is 190 to 340 feet thick in the Grand Staircase region and 150 to 350 feet thick in the Escalante Canyons region. The Kayenta Formation was deposited under dominantly fluvial conditions, but does have some interbedded lacustrine and eolian deposits. The Navajo Sandstone is extensive in the GSENM, forming massive cliffs, with high-angle cross-beds. It ranges from 1,300 to 1,500 feet thick in the Grand Staircase region and from 1,100 to 1,300 feet thick in the Escalante Canyons region. The Navajo Sandstone is mainly a light-colored, fine- to medium-grained massive sandstone cemented with silica; however, lenses of limestone, dolomite, mudstone, and ironstone are present in some areas. It forms cliffs, domes, monuments, deep canyons, and unique erosional features (Doelling et al., 2000).

The Page Sandstone and Carmel Formation intertongue in both the Grand Staircase region and the Escalante Canyons region and are 180 to 1,040 feet thick. In the Escalante Canyons region, Page Sandstone and Carmel Formation outcrops are found along the eastern boundary of the Kaiparowits Plateau. The Page Sandstone represents beach and dune deposits, whereas the Carmel Formation represents marine deposits and contains gypsum beds. The Entrada Sandstone is present in all three physiographic regions of the GSENM and is up to 1,000 feet thick. It is composed of the Gunsight Butte, Cannonville, and Escalante Members. The Romana Mesa Sandstone is present in all three physiographic regions of the GSENM. It is up to 135 feet thick and is often combined with Entrada Sandstone. The Henrieville Sandstone is present in the Grand Staircase and Kaiparowits Plateau regions. It is up to 234 feet thick, and is often combined with Entrada Sandstone (Doelling et al., 2000).

The Morrison Formation is present in the Kaiparowits Plateau and the Escalante Canyons regions along the east and south margins of the

Kaiparowits Plateau. The Morrison Formation is up to 950 feet thick and includes the Tidwell, Salt Wash, and Brushy Basin Members (Doelling et al., 2000).

### **Cretaceous Formations**

Cretaceous rock formations dominate the Kaiparowits Plateau region and are 5,000 to 6,000 feet thick. Cretaceous rocks include the Cedar Mountain Formation, the Dakota Formation, the Tropic Shale, the Straight Cliffs Formation, the Wahweap Formation, and the Kaiparowits Formation. These rocks were deposited under marine, mixed marine and continental, and continental conditions (Doelling et al., 2000).

The Cedar Mountain Formation is a resistant conglomeratic sandstone with outcrops up to 50 feet thick, and is often combined with the Dakota Formation. The Dakota Formation is exposed along the edges of the Kaiparowits Plateau and is up to 370 feet thick. It primarily consists of mudstone and shale in the lower part, and of sandstone and mudstone in the upper part. Coal beds are present in both the lower and upper part. The Tropic Shale is exposed around the edges of the Kaiparowits Plateau and ranges in thickness from 500 to 750 feet. It is mainly gray mudstone and shale that forms slopes commonly covered by mass movement deposits (Doelling et al., 2000).

The Straight Cliffs Formation is 900 to 1,800 feet thick and is composed of the Tibbet Canyon, Smoky Hollow, John Henry, and Drip Tank Members. The Tibbet Canyon Member is a cliff-forming sandstone. The Smoky Hollow Member is a cliff- and ledge-forming sandstone, shale, and mudstone, with minor amounts of coal. The John Henry Member is a ledge- and slope-forming sandstone and mudstone with significant amounts of coal. Natural coal fires are common in this member, earning it the name "Burning Hills." The Drip Tank Member is a prominent cliff-forming sandstone (Doelling et al., 2000).

The Wahweap Formation is 1,000 to 1,500 feet thick and is composed of a lower slope-forming unit and an upper cliff-forming unit. The Wahweap Formation consists of mudstone, claystone, siltstone, resistant and non-resistant sandstone, and conglomerate. The Kaiparowits Formation is 2,000 to 3,000 feet thick and is a muddy sandstone which forms slopes and badlands (Doelling et al., 2000).

### **Quaternary Deposits**

Quaternary alluvial deposits are present throughout the GSENM as channel deposits, overbank or flood plain deposits, terrace deposits, and alluvial fans. Quaternary eolian deposits from reworked sand and other fine material are also present throughout the GSENM.



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# Glossary

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- AC soil.** A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.
- Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.
- Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.
- Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.
- Alluvial fan.** A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes, shaped like an open fan or a segment of a cone. This material was deposited by a stream (best expressed in semiarid regions) at the place where it issues from a narrow mountain or upland valley; or where a tributary stream is near or at its junction with the main stream. It is steepest near its apex, which points upstream and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.
- Alluvial flat.** (a) (colloquial: western U.S.) A nearly level, graded, alluvial surface which commonly does not manifest traceable channels, terraces, or floodplain levels. (b) (not preferred) A general term for a small flood plain bordering a river, on which alluvium is deposited during floods.
- Alluvium.** Unconsolidated, clastic material subaerially deposited by running water, including gravel, sand, silt, clay, and various mixtures of these.
- Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.
- Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.
- Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.
- Aspect.** The direction in which a slope faces.
- Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.
- Backslope.** The geomorphic component that forms the steepest incline surface and principal element of many hillsides. Backslopes in profile are commonly steep, are linear and may or may not include cliff segments.
- Badland.** A landscape which is intricately dissected and characterized by a very fine drainage network that has high drainage densities and short, steep slopes with narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover, overlying unconsolidated or poorly cemented materials (clays, silts or in some cases sandstones) sometimes with soluble materials such as gypsum or halite.
- Basal area.** The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.
- Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na and K), expressed as a percentage of the total cation-exchange capacity.
- Bedrock.** A general term for the solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Blowout.** A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand, loose soil, or where protective vegetation is disturbed or destroyed; the adjoining accumulation of sand derived from the depression, where recognizable, is commonly included.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Breaks.** A landscape or large tract of steep, rough, or

broken land that is dissected by ravines and gullies and marks a sudden change in topography, as from an elevated plain to lower hilly terrain, or a line of irregular cliffs at the edge of a mesa or a river.

**Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

**Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

**Caliche.** A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Fine crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in non-indurated forms to very strong in types that are indurated. Other minerals (carbonates, silicate and sulfate) may be present as accessory cements.

**Canopy.** The leafy crown of trees or shrubs. (See *Crown*.)

**Canyon.** A long, deep, narrow, very steep-sided valley cut primarily in bedrock with high and precipitous walls in an area of high local relief, often with a perennial stream at the bottom.

**Canyonlands.** A deeply and extensively dissected landscape composed predominantly of relatively narrow, steep-walled valleys with small flood plains or valley floors; commonly with considerable outcrops of hard bedrock on steep slopes, ledges, or cliffs and with broader summits or interfluves than found in badlands.

**Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

**Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other

stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

**Channel.** (a) The hollow bed where a natural body of surface water flows or may flow. The deepest or central part of the bed of a stream, containing the main current and occupied more or less continuously by water. (b) The bed of a single or braided watercourse that commonly is barren of vegetation and is formed of modern alluvium. Channels may be enclosed by banks or splayed across and slightly mounded above a fan surface and include bars and mounds of cobbles and stones. (c) Small, trough-like, arcuate or sinuous channels separated by small bars or ridges, caused by fluvial processes; common to flood plains and young alluvial terraces.

**Chemical treatment.** Control of unwanted vegetation through the use of chemicals.

**Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

**Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

**Claypan.** A dense, compact, slowly permeable layer in the subsoil that has a higher clay content than overlying materials from which it is separated by a sharply-defined boundary. Claypans are commonly hard when dry and plastic and sticky when wet.

**Cliff.** Any high, very steep to perpendicular or overhanging face of rock or earth; a precipice.

**Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Climbing dune.** A dune formed by the piling-up of sand by wind against a cliff or mountain slope; very common in arid regions with substantial local relief and strong winds.

**Coarse textured soil.** Sand or loamy sand.

- Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
- Cobbly soil material.** Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments and extremely cobbly soil material has more than 60 percent.
- Colluvium.** Unconsolidated, unsorted earth material being transported or deposited on sideslopes and/or at the base of slopes by mass movement and by local, unconcentrated runoff.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.
- Conglomerate.** A coarse-grained, clastic sedimentary rock composed of rounded to subangular rock fragments larger than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material; cements include silica, calcium carbonates, and iron oxides. Conglomerate is the consolidated equivalent of gravel.
- Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.
- Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.
- Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."
- Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between a depth of 10 inches and 40 or 80 inches.
- Corrosion.** The process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.
- Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.
- Cropping system.** Growing crops according to a planned system of rotation and management practices.
- Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility; and helps to control erosion.
- Crown.** The upper part of a tree or shrub, including the living branches and their foliage.
- Cuesta.** An asymmetric, homoclinal ridge capped by resistant rock layers of slight to moderate dip (commonly less than 15 percent); produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side that roughly parallels the inclined beds, and on the other side it has a relatively short and steep or cliff-like slope that cuts through the tilted rocks.
- Culmination of the mean annual increment (CMAI).** The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment

continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

**Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.

**Debris slide.** (a) A rapid slide or roll of comparatively dry and largely unconsolidated earthy material downslope (does not exhibit backward rotation) which results in an irregular, hummocky deposit somewhat resembling a moraine. (b) The sediments associated with the process described above or the landform that results from it.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.

**Dense layer** (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Depth to rock** (in tables). Bedrock is too near the surface for the specified use.

**Desert pavement.** Natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments, mantling a desert surface. It is formed where wind action and sheetwash have removed all smaller particles or where coarse fragments have migrated upward through sediments to the surface. It usually protects the underlying, finer-grained material from further deflation. The coarse fragments commonly are cemented by mineral matter.

**Dipslope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedded rocks.

**Drainage class** (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained,*

*somewhat poorly drained, poorly drained, and very poorly drained.* These classes are defined in the "Soil Survey Manual."

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drainageway.** (a) A general term for a course of channel along which water moves in draining an area. (b) A term restricted to relatively small, roughly linear or arcuate depressions that move concentrated water at some time and either lack a defined channel or have a small, defined channel.

**Draw.** A small, natural watercourse cut in unconsolidated materials, generally more open with a broader floor and more gently sloping slides than a ravine or gulch.

**Duff.** A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**Dune.** A low mound, ridge, bank or hill of loose, windblown, subaerially deposited granular material (generally sand), either barren and capable of movement from place to place, or covered and stabilized with vegetation, but retaining its characteristic shape.

**Duripan.** A mineral soil horizon that is cemented by silica (usually opal or microcrystalline forms of silica) to the point that air-dry fragments will not slake in water or HCL. A duripan may also have accessory cement such as iron oxide or calcium carbonate.

**Ecological site.** An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Eolian.** Material transported and deposited by the wind. Includes clastic materials such as dune sands, sand sheets, loess deposits, and clay.

**Eolian deposits.** Sand, silt, or clay-sized clastic material transported and deposited primarily by

wind, commonly in the form of a dune or a sheet of sand or loess.

**Eolian sands.** Sand-sized, clastic material transported and deposited primarily by wind, commonly in the form of a dune or sand sheet.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

**Erosion.** The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as mass wasting, corrosion, and gravitational creep.

*Erosion (geologic).* Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion (accelerated).* Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Erosion pavement.** A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

**Escarpment.** A relatively continuous and steep slope or cliff produced by erosion or faulting and that topographically interrupts or breaks the general continuity of more gently sloping land surfaces. The term is most commonly applied to cliffs produced by differential erosion.

**Excess fines** (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

**Excess lime** (in tables). Excess carbonates in the soil that restrict the growth of some plants.

**Excess salts** (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

**Excess sodium** (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

**Excess sulfur** (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the

soil is drained, and the growth of most plants is restricted.

**Extrusive rock.** Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

**Fan.** (a) A gently sloping, fan-shaped mass of detritus forming a section of a low-angle cone commonly at a place where there is a notable decrease in gradient; specifically an alluvial fan. (b) A fan-shaped mass of congealed lava that formed on a steep slope by the continually changing direction of flow.

**Fan remnant.** A general term for landforms that are the remaining parts of older fan-landforms, such as alluvial fans, fan aprons, inset fans, and fan skirts, that either have been dissected (erosional fan-remnants) or partially buried (nonburied fan-remnants). An erosional fan remnant must have a relatively flat summit that is a relict fan-surface. A nonburied fan-remnant is a relict surface in its entirety.

**Fault.** A discrete surface (fracture) or zone of discrete surfaces separating two rock masses across which one mass has slid past the other.

**Fault line.** The trace of a fault plane on the ground surface or on a reference plane.

**Fault zone.** A fault that is expressed as a zone of numerous small fractures or of breccia or fault gouge. A fault zone may be as wide as hundreds of meters.

**Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

**Fine textured soil.** Sandy clay, silty clay, or clay.

**Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

**Flood plain.** A nearly level plain that borders a stream and is subject to inundation under flood stage conditions unless protected artificially. It is usually a constructional landform built of sediment deposited during overflow and lateral migration of the streams.

- Fluvial.** Of or pertaining to rivers or stream; produced by stream or river action.
- Foothill.** A steeply sloping upland composed of hills with relief of 30 up to 300 meters (100 to 1,000 feet) and fringes a mountain range or high-plateau escarpment.
- Footslope.** The hillslope profile position that forms the concave surface at the base of a hillslope. It is a transition zone between upslope sites of erosion and transport and downslope sites of deposition.
- Forb.** Any herbaceous plant not a grass or a sedge.
- Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.
- Forest type.** A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Geomorphic component.** A fundamental, three-dimensional piece or area of a geomorphic setting that has unique and prevailing kinetic energy dynamics and sediment transport conditions which result in their characteristic form, patterns of sedimentation, and soil development.
- Geomorphic surface.** A mappable area of the earth's surface that has a common history; the area is of similar age and is formed by a set of processes during an episode of landscape evolution. A geomorphic surface can be erosional, constructional, or both. The surface shape can be planar, concave, convex, or any combination of these.
- Geomorphology.** The science that treats the general configuration of the earth's surface; specifically the study of the classification, description, nature, origin, and development of landforms and their relationships to underlying structures; and of the history of geologic changes as recorded by these surface features. The term is especially applied to the genetic interpretation of landform.
- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Ground water.** Water filling all the unblocked pores of the material below the water table.
- Gully.** A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water usually during and immediately following heavy rains or ice/snow melt. A gully generally is an obstacle to wheeled vehicles and too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
- Gypsum.** A hydrated sulfate of calcium, occurring naturally in sedimentary rocks and used for making plaster of Paris.
- Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.
- Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.
- Hard to reclaim** (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.
- High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.
- Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.
- Hillslopes.** A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of the hill.
- Homoclinal.** Pertaining to strata that dip in one direction with uniform angle.
- Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions

of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual."

The major horizons of mineral soil are as follows:

*O horizon*.—An organic layer of fresh and decaying plant residue.

*A horizon*.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon*.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon*.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon*.—The mineral horizon or layer, excluding indurated bedrock that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon*.—Soft, consolidated bedrock beneath the soil.

*R layer*.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one

horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Increasesers.** Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasesers commonly are the shorter plants and the less palatable to livestock.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application.

**Interfluve.** A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same direction. An elevated area between two drainageways that sheds water to those drainageways.

**Intermittent stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Invaders.** On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

**Iron depletions.** Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are:  
*Basin*.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

*Border.*—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

*Controlled flooding.*—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation.*—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Drip (or trickle).*—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

*Furrow.*—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

*Sprinkler.*—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

*Subirrigation.*—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

*Wild flooding.*—Water, released at high points, is allowed to flow onto an area without controlled distribution.

**Knoll.** A small, low, rounded hill rising above adjacent landforms.

**$K_{sat}$ .** Saturated hydraulic conductivity. (See Permeability.)

**Lacustrine deposit.** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Lamella.** A thin (<7.5 cm thick) discontinuous or continuous, generally horizontal layer of fine material (especially clay and iron oxides) that has been pedogenically concentrated within a coarser, eluviated layer.

**Landform.** Any physical, recognizable form or feature on the earth's surface, having a characteristic shape and range in composition and produced by natural causes; it can span a wide range in size. Landforms provide an empirical description of similar portions of the earth's surface.

**Landscape.** An assemblage, group, or family of spatially-related, natural landforms over a relatively large area; the land surface which the eye can comprehend in a single view.

**Landslide.** A general, encompassing term for most types of mass movement landforms and processes involving the downward transport and outward deposition of soil and rock materials, caused by gravitational forces and which may or

may not involve saturated materials. Names of landslide types generally reflect the dominant process and/or the resultant landform. The main operational categories of mass movement are fall (rockfall, soil fall, topple), slide (rotational landslide, debris slide), flow (rockfall avalanche), debris avalanche, and debris flow.

**Large stones** (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Ledge.** (a) A narrow shelf or projection of rock, much longer than wide, formed on a rock wall or cliff face, as along a coast by differential wave action on softer rocks; erosion is by combined biological and chemical weathering. (b) A rocky outcrop, solid rock. (c) A shelf-like quarry exposure or natural rock outcrop.

**Limestone.** A sedimentary rock consisting chiefly (more than 50 percent) of calcium carbonate, primarily in the form of calcite. Limestones are usually formed by a combination of organic and inorganic processes and include chemical and clastic (soluble and insoluble) constituents; many contain fossils.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess.** Material transported and deposited by wind and consisting predominantly of silt-sized particles. Commonly a loess deposit thins and the mean-particle size decreases as distance from the source area increases. Loess sources are dominantly either glacial melt waters or non-glacial, arid environments, such as deserts. Several types of loess deposits can be recognized based on mineralogical composition.

**Low hills.** An elevated, generally rounded land surface with low local relief, rising between 30 and 90 meters (100 to 300 feet) above surrounding lowlands.

**Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

**Low strength.** The soil is not strong enough to support loads.

**Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary

with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

**Mass movement.** Any process or sediments resulting from the dislodgement and downslope transport of soil and rock material as a unit under direct gravitational stress. The process includes slow displacements, such as creep and solifluction, and rapid movements, such as landslides; rock slides and falls; earthflows; debris flows; and avalanches. Agents of fluid transport (water, ice, air) may play an important, if subordinate role in the process.

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Mesa.** A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal bedrock. The summit width is greater than the height of bounding escarpments.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Microbiotic crust.** A thin surface layer (crust) of soil particles bound together primarily by living organisms and their organic byproducts; thickness can range from less than 1 cm up to 10 cm; aerial coverage of the ground surface can range from 10 to 100 percent. Crusts stabilize loose earthy material. Other types of surface crusts include chemical crusts (salt crusts) and physical crusts (raindrop-impact crusts).

**Microfeature.** Small, local, natural forms (features) on the land surface that are too small to delineate on the topographic or soil map at commonly used map scales.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Monocline.** (a) A unit of folded strata that dips from the horizontal in one direction only, is not part of an anticline or syncline, and occurs at the earth's surface. This structure is typically present in plateau areas where nearly flat strata locally assume steep dips caused by differential vertical movement without faulting. (b) A local steepening in an otherwise uniform gentle dip.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons; and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mountain.** A natural elevation of the land surface, rising more than 300 meters (1,000 feet) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

**Mountain slope.** A part of a mountain between the summit and the foot.

**Mudstone.** (a) A blocky or massive, fine-grained sedimentary rock in which the proportions of clay and silt are approximately equal. (b) A general term that includes clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amount of clay and silt are not known or cannot be precisely identified.

**Munsell notation.** A designation of color by degrees of three simple variables—hue, value and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6 and chroma of 4.

**Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

**Neutral soil.** A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

**Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low .....	less than 0.5 percent
Low .....	0.5 to 1.0 percent
Moderately low .....	1.0 to 2.0 percent
Moderate .....	2.0 to 4.0 percent
High .....	4.0 to 8.0 percent
Very high .....	more than 8.0 percent

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pediment.** A gently sloping erosional surface developed at the foot of a receding hill or mountain slope. The surface may be essentially bare, exposing earth material that extends beneath adjacent uplands; or it may be thinly mantled with alluvium and colluvium, ultimately in transit from upland front to basin or valley lowland. In hillfoot slope terrain, the mantle is designated "pedisediment." The term has been used in several geomorphic contexts. Pediments may be classed with respect to (a) landscape positions, for example, intermontane-basin piedmont or valley-border footslope surfaces; (b) type of material eroded, bedrock or regolith; or (c) combinations of the above.

**Pedisediment.** A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher-lying areas of the erosion surface.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large

enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable .....	less than 0.0015 inch
Very slow .....	0.0015 to 0.06 inch
Slow .....	0.06 to 0.2 inch
Moderately slow .....	0.2 to 0.6 inch
Moderate .....	0.6 inch to 2.0 inches
Moderately rapid .....	2.0 to 6.0 inches
Rapid .....	6.0 to 20 inches
Very rapid .....	more than 20 inches

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Pitting** (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

**Plain.** Any flat, lowland area, large or small, at a low elevation. Specifically, any extensive region of comparatively smooth and level gently undulating land. A plain has few or no prominent hills or valleys but sometimes has considerable slopes and usually occurs at low elevation relative to surrounding areas. Where dissected, remnants of a plain can form the local uplands. A plain may be forested or bare of trees and may be formed by deposition or erosion.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plateau.** An extensive upland mass with relatively flat

summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

**Pleistocene.** The epoch of the Quaternary Period of geologic time (from about 10 or 12 thousand to 1.6 million years ago), following the Pliocene Epoch and preceding the Holocene; also the corresponding (time-stratigraphic) "series" of earth materials.

**Plowpan.** A compacted layer formed in the soil directly below the plowed layer.

**Polygon.** A type of patterned ground consisting of a closed, roughly equidimensional figure bounded by more or less straight sides; some sides may be irregular. Refer to patterned ground.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).**

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Quaternary.** The period of the Cenozoic Era of geologic time, extending from the end of the Tertiary period (about 1.6 million years ago) to the present and comprising two epochs, the Pleistocene (Ice Age) the Holocene (recent); also,

the corresponding (time-stratigraphic) "series" of earth materials.

**Range condition.** The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Range site.** An area of rangeland where climate, soil and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid .....	less than 3.5
Extremely acid .....	3.5 to 4.4
Very strongly acid .....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Moderately acid .....	5.6 to 6.0
Slightly acid .....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Slightly alkaline .....	7.4 to 7.8
Moderately alkaline .....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline .....	9.1 and higher

**Red beds.** Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

**Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha, alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

**Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

**Ridge.** A long, narrow elevation of the land surface, usually sharp-crested with steep sides and forming an extended upland between valleys. The term is used in areas of both hill and mountain relief.

**Rill.** A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from ground water. Classes from low to high are negligible, very low, low, medium, high, and very high, respectively.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

**Sand.** As a soil separate, individual rock or mineral

fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sand ridge.** One of a series of long, wide, extremely low, parallel ridges believed to represent the eroded stumps of former longitudinal sand dunes.

**Sand sheet.** A large, irregularly shaped, commonly thin, surficial mantle of eolian sand lacking the discernible slip faces that are common on dunes.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Scarp.** An escarpment, cliff, or steep slope of some extent along the margin of a plateau, mesa, terrace, or structural bench. A scarp may be of any height.

**Scree.** A collective term for an accumulation of coarse rock debris or a sheet of coarse debris mantling a slope. Scree is not a synonym for talus, as scree includes loose, coarse fragment material on slopes without cliffs.

**Scree slope.** A portion of a hillside or mountain slope mantled by scree and lacking an upslope rockfall source.

**Sediment.** Material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by water, wind, ice or mass-wasting and has come to rest on the earth's surface either above or below sea level. Sediment in a broad sense also includes materials precipitated from solutions or emplaced by explosive volcanism, as well as organic remains.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Seepage (in tables).** The movement of water through the soil. Seepage adversely affects the specified use.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture

of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shrink-swell** (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Shrub-coppice dune.** A small, streamlined dune that forms around brush and clump vegetation.

**Side slope.** A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Sinkhole.** A depression in the landscape where limestone has been dissolved.

**Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

**Slickensides.** Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms and columns; and in swelling clayey soils, where there is marked change in moisture content.

**Slick spot.** A small area of soil having a puddled, crusted, or smooth surface and an excess of

exchangeable sodium. The soil generally is silty or clayey, is slippery when wet and is low in productivity.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

**Slot canyon.** A long, narrow, deep and tortuous channel or drainageway with sheer rock walls eroded into sandstone or other sedimentary rocks, especially in the semi-arid western U.S. Slot canyons are subject to flash flood events; depth to width ratios exceed 10:1 over most of its length and can approach 100:1. Slot canyons commonly contain unique ecological communities that are distinct from the adjacent, drier uplands.

**Slow refill** (in tables). The slow filling of ponds resulting from restricted permeability in the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++} + \text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are:

Slight .....	less than 13:1
Moderate .....	13-30:1
Strong .....	more than 30:1

**Sodium adsorption ratio (SAR).** A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging

between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay .....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stream.** (a) Any body of running water that moves under gravity to progressively lower levels, in a relatively narrow but clearly defined channel on the ground surface, in a subterranean cavern, or beneath a glacier. It is a mixture of water and dissolved, suspended, or entrained matter. (b) A term used in quantitative geomorphology interchangeably with channel.

**Stream channel.** Refer to channel.

**Stream terrace.** One or a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream and representing the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition. Erosional surfaces cut into bedrock and thinly mantled with stream deposits (alluvium) are called "strath terraces." Remnants of constructional valley floors thickly mantled with alluvium are called alluvial terraces.

**Strippcropping.** Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

**Structural bench.** A platform-like, nearly level to gently inclined erosional surface developed on resistant strata in areas where valleys are cut in alternating strong and weak layers with an essentially horizontal attitude. Structural benches are bedrock controlled and in contrast to stream terraces, have no geomorphic implication of former, partial erosion cycles and base-level controls; nor do they represent a stage of floodplain development following an episode of valley trenching.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular) and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Any soil horizon (A, E, AB, or EB) below the surface layer.

**Summit.** The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Talus.** Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to

that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

**Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace (geologic).** An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer (in tables).** Otherwise suitable soil material that is too thin for the specified use.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Upland.** Land at a higher elevation, in general, than the

alluvial plain or stream terrace; land above the lowlands along streams.

**Valley.** An elongate, relatively large, externally drained depression of the earth's surface that is primarily developed by stream erosion or glacial activity.

**Valley floor.** A nearly level to gently sloping, lowest surface of a valley. Landforms include axial stream channels, the flood plain, flood plain steps, and, in some areas, low terrace surfaces.

**Valley side.** The sloping to very steep surfaces between the valley floor and summits of adjacent uplands. Well-defined, steep valley sides have been termed valley walls.

**Wash.** The broad, flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut into alluvium.

**Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

**Well graded.** Refers to soil material consisting of coarse-grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

**Windthrow.** The uprooting and tipping over of trees by the wind.



# Tables

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The tables and associated interpretations for soil uses are based upon each map unit's soil profile and not its range in characteristics as displayed in each taxonomic unit. Each interpretation is site-specific and may not represent all the variations that may be present on the landscape.

Table 1.--Temperature and Precipitation

Data recorded at Station UT2592 in Escalante, Utah, in the period from 1961 to 1990. Average number of days a year with at least 1 inch of snow on the ground: 29.

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
°F	°F	°F	°F	°F	Units	In	In	In		In	
January-----	41.0	14.1	27.6	60	-8	6	0.78	0.22	1.39	2	8.8
February-----	47.2	20.9	34.0	65	-1	22	0.64	0.24	1.15	1	4.4
March-----	54.5	26.3	40.4	73	8	95	0.90	0.44	1.47	2	5.7
April-----	63.7	32.4	48.0	80	18	256	0.50	0.12	0.94	1	1.5
May-----	73.8	39.9	56.8	89	26	522	0.68	0.19	1.26	2	0.0
June-----	84.5	47.6	66.1	99	33	782	0.41	0.12	0.79	1	0.0
July-----	89.9	54.7	72.3	99	43	1001	1.06	0.37	1.63	3	0.0
August-----	86.6	52.8	69.7	97	41	913	1.51	0.62	2.27	4	0.0
September---	78.4	44.5	61.5	92	29	644	1.04	0.32	1.63	2	0.0
October-----	67.2	35.1	51.2	84	18	351	0.98	0.23	1.69	2	0.3
November-----	53.0	25.4	39.2	71	7	78	0.83	0.17	1.43	2	3.1
December-----	42.8	16.5	29.6	59	-4	6	0.70	0.17	1.26	2	6.6
Yearly:											
Average---	65.2	34.2	49.7	---	---	---	---	---	---	---	---
Extreme---	102	-17	---	100	10	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,677	10.04	7.77	12.13	24	30.4

Table 1.--Temperature and Precipitation

Data recorded at Station UT4508 in Kanab, Utah in the period from 1961 to 1990. Average number of days a year with at least 1 inch of snow on the ground: 14.

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	48.1	22.4	35.2	65	0	30	1.50	0.32	2.50	3	7.4
February-----	53.5	26.4	39.9	71	5	78	1.32	0.47	2.29	3	4.5
March-----	58.7	30.4	44.5	77	14	173	1.60	0.57	2.65	4	3.3
April-----	67.0	35.5	51.2	84	21	343	0.92	0.23	1.52	2	1.8
May-----	77.0	43.2	60.1	92	27	621	0.72	0.18	1.19	2	0.0
June-----	87.5	51.2	69.4	101	38	880	0.32	0.11	0.63	1	0.0
July-----	92.5	58.5	75.5	103	47	1088	1.01	0.26	1.61	2	0.0
August-----	89.8	57.1	73.4	101	46	1035	1.49	0.54	2.27	4	0.0
September---	82.7	49.6	66.2	95	36	785	0.94	0.23	1.57	2	0.0
October-----	72.7	40.0	56.4	88	24	508	0.98	0.25	1.62	2	0.1
November-----	58.9	30.5	44.7	77	12	176	1.27	0.30	2.03	2	1.7
December-----	49.5	23.4	36.4	66	0	40	1.24	0.28	2.07	3	5.3
Yearly:											
Average---	69.8	39.0	54.4	---	---	---	---	---	---	---	---
Extreme---	108	-10	---	103	-4	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,759	13.31	9.59	16.75	30	24.1

Table 1.--Temperature and Precipitation

Data recorded at Station UT8847 in Tropic, Utah in the period from 1961 to 1990. Average number of days a year with at least 1 inch of snow on the ground: 20.

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	40.9	14.7	27.8	60	-6	5	0.95	0.29	1.61	2	7.2
February-----	44.9	18.9	31.9	64	-3	14	0.99	0.23	1.73	2	8.2
March-----	51.0	23.6	37.3	70	7	51	1.17	0.50	1.89	3	5.8
April-----	59.6	29.0	44.3	78	13	170	0.74	0.15	1.19	2	1.4
May-----	69.4	36.3	52.8	85	20	399	0.69	0.30	1.17	2	0.2
June-----	79.6	44.8	62.2	93	31	661	0.39	0.16	0.73	1	0.0
July-----	84.9	51.7	68.3	95	37	860	1.16	0.49	1.81	3	0.0
August-----	81.8	49.4	65.6	93	36	789	1.90	0.69	2.90	4	0.0
September---	74.0	41.6	57.8	87	27	526	1.14	0.54	1.73	3	0.0
October-----	64.5	33.6	49.0	80	16	295	1.07	0.40	1.85	3	0.2
November-----	50.6	23.3	36.9	68	5	50	1.03	0.32	1.68	2	2.6
December-----	42.1	15.7	28.9	59	-5	4	0.98	0.28	1.82	2	4.6
Yearly:											
Average---	61.9	31.9	46.9	---	---	---	---	---	---	---	---
Extreme---	100	-18	---	96	-9	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,823	12.21	8.01	14.58	29	30.2

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period from 1961 to 1990 at Escalante, Kanab, and Tropic)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
ESCALANTE, UT2592			
Last freezing temperature in spring:			
1 year in 10 later than--	April 29	May 15	June 5
2 years in 10 later than--	April 23	May 10	May 30
5 years in 10 later than--	April 12	May 2	May 18
First freezing temperature in fall:			
1 year in 10 earlier than--	October 11	Sept. 25	Sept. 18
2 years in 10 earlier than--	October 17	October 1	Sept. 23
5 years in 10 earlier than--	October 28	October 13	October 4
KANAB, UT4508			
Last freezing temperature in spring:			
1 year in 10 later than--	May 1	May 10	May 21
2 years in 10 later than--	April 22	May 3	May 15
5 years in 10 later than--	April 4	April 19	May 3
First freezing temperature in fall:			
1 year in 10 earlier than--	October 29	October 13	October 4
2 years in 10 earlier than--	November 3	October 19	October 10
5 years in 10 earlier than--	November 13	October 30	October 21

Table 2.--Freeze Dates in Spring and Fall--Continued

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
TROPIC, UT8847			
Last freezing temperature in spring:			
1 year in 10 later than--	May 22	May 30	June 20
2 years in 10 later than--	May 14	May 25	June 14
5 years in 10 later than--	April 30	May 16	June 2
First freezing temperature in fall:			
1 year in 10 earlier than--	October 1	Sept. 13	Sept. 9
2 years in 10 earlier than--	October 7	Sept. 20	Sept. 14
5 years in 10 earlier than--	October 20	October 2	Sept. 24

Table 3.--Growing Season

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
ESCALANTE, UT2592			
9 years in 10	177	143	112
8 years in 10	184	150	121
5 years in 10	199	164	138
2 years in 10	213	177	156
1 year in 10	221	184	165
KANAB, UT4504			
9 years in 10	190	165	144
8 years in 10	201	174	153
5 years in 10	223	193	170
2 years in 10	244	211	187
1 year in 10	255	221	195
TROPIC, UT8847			
9 years in 10	141	113	88
8 years in 10	152	121	96
5 years in 10	173	138	113
2 years in 10	194	155	130
1 year in 10	205	163	139

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
5001	Mido loamy fine sand, 2 to 15 percent slopes-----	5,126	0.3
5002	Dune land-----	465	*
5003	Milok, cool-Barx, dry complex, 1 to 5 percent slopes-----	3,710	0.2
5004	Rock outcrop (Navajo Sandstone)-----	75,399	4.0
5006	Milok fine sandy loam, cool, 2 to 8 percent slopes-----	2,279	0.1
5007	Rock outcrop (Navajo Sandstone)-Nalc case complex, 2 to 30 percent slopes-----	37,563	2.0
5008	Simel complex, 2 to 60 percent slopes-----	1,488	*
5009	Wayneco sandy loam, dry, 2 to 15 percent slopes-----	1,977	0.1
5010	Retsabal-Lemrac complex, 2 to 60 percent slopes-----	4,711	0.2
5011	Badland (Carmel Formation)-Rizno, cool-Nonip complex, 5 to 25 percent slopes-----	14,872	0.8
5012	Santrick-Nalc case-Bispen complex, 2 to 30 percent slopes-----	2,611	0.1
5013	Mido-Yarts complex, 2 to 15 percent slopes-----	5,728	0.3
5015	Mespu fine sand, 2 to 15 percent slopes-----	12,434	0.7
5017	Skos, dry-Mido-Arches, dry complex, 2 to 15 percent slopes-----	9,332	0.5
5018	Skos channery loam, dry, 5 to 30 percent slopes-----	2,648	0.1
5019	Skos, dry-Rock outcrop (Carmel Formation)-Arches, dry complex, 15 to 60 percent slopes-----	8,275	0.4
5020	Rock outcrop (Navajo Sandstone)-Mespu fine sand-Nalc case complex, 2 to 30 percent slopes-----	34,295	1.8
5021	Milok, cool-Anasazi, cool complex, 2 to 8 percent slopes-----	2,105	0.1
5023	Tsaya channery loam, 5 to 25 percent slopes-----	2,136	0.1
5025	Yarts sandy loam, 2 to 8 percent slopes-----	1,974	0.1
5026	Rock outcrop (Entrada and Carmel Formation sandstone)-----	11,618	0.6
5027	Badland (Tropic Formation Shale)-Cannonville-Rock outcrop (Dakota Formation) complex, 30 to 50 percent slopes-----	21,386	1.1
5028	Badland (Entrada Formation)-----	662	*
5029	Rock outcrop (Straight Cliffs Formation)-Atchee family, steep-Chilton family complex, 50 to 80 percent slopes-----	38,044	2.0
5030	Catahoula-Clapper, dry complex, 15 to 60 percent slopes-----	28,904	1.5
5031	Moclom-Rock outcrop (Morrison Formation) complex, 2 to 15 percent slopes-----	2,592	0.1
5032	Remorris-Kenzo, steep-Rock outcrop (Morrison and Entrada Formations) complex, 30 to 60 percent slopes-----	6,327	0.3
5033	Yarts fine sandy loam, 15 to 40 percent slopes, eroded-----	2,466	0.1
5034	Nonip very channery loam, 5 to 25 percent slopes-----	6,567	0.3
5035	Earlweed-Mido complex, 2 to 30 percent slopes-----	6,148	0.3
5037	Barx fine sandy loam, 2 to 10 percent slopes-----	10,177	0.5
5038	Mido-Rock outcrop (Entrada Formation) complex, 5 to 40 percent slopes-----	6,278	0.3
5040	Sazi-Milok, cool complex, 2 to 30 percent slopes-----	3,181	0.2
5041	Seeg, warm-Pagina complex, 2 to 15 percent slopes-----	996	*
5042	Moenkopie, warm-Moepitz-Rock outcrop (Carmel Formation) complex, 10 to 30 percent slopes-----	6,565	0.3
5043	Daklos, steep-Rock outcrop (Morrison Formation and Romana Mesa Sandstone) complex, 30 to 70 percent slopes-----	5,746	0.3
5044	Dient very stony loam, 15 to 50 percent slopes-----	5,818	0.3
5046	Moffat-Sheppard-Nakai complex, 2 to 30 percent slopes-----	13,714	0.7
5047	Moffat-Seeg, warm-Mack, moist complex, 2 to 15 percent slopes-----	4,064	0.2
5049	Moffat-Mack, moist complex, 1 to 5 percent slopes-----	3,710	0.2
5050	Daklos-Arches, dry complex, 2 to 15 percent slopes-----	5,467	0.3
5052	Yarts-Suwanee complex, 1 to 8 percent slopes-----	386	*
5053	Milok fine sand, 2 to 8 percent slopes-----	1,950	0.1
5055	Mivida-Barx, dry complex, 1 to 8 percent slopes-----	5,865	0.3
5057	Arches, dry-Mident-Yarts complex, 2 to 40 percent slopes-----	6,670	0.4
5058	Earlweed-Mivida complex, 2 to 20 percent slopes-----	1,506	*
5059	Mivida-Yarts, moist complex, 2 to 8 percent slopes-----	1,382	*
5060	Ranion-Suzipon-Rock outcrop (Navajo Sandstone) complex, 2 to 30 percent slopes-----	3,799	0.2
5061	Rock outcrop (Navajo Sandstone)-Suzipon-Peekaboo complex, 2 to 30 percent slopes-----	6,662	0.4
5062	Peekaboo-Spooky-Suzipon complex, 2 to 15 percent slopes-----	4,592	0.2

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
5063	Rock outcrop (Navajo and Carmel Formations)-Moenkopi, warm-Needle complex, 15 to 35 percent slopes-----	913	*
5065	Trail-Sheppard complex, 2 to 10 percent slopes-----	707	*
5067	Ranion-Peekaboo complex, 2 to 20 percent slopes-----	3,277	0.2
5068	Seeg, warm-Moffat-Needle complex, 2 to 25 percent slopes-----	2,080	0.1
5069	Rock outcrop (Entrada Formation)-Nepalto, moist complex, 2 to 8 percent slopes-----	458	*
5071	Somorent-Rock outcrop (Morrison Formation) complex, 15 to 40 percent slopes-----	1,567	*
5073	Kenzo-Nalcase complex, 2 to 15 percent slopes-----	13,102	0.7
5074	Evpark-Vessilla complex, 2 to 15 percent slopes-----	8,092	0.4
5075	Shalona sandy loam, 2 to 8 percent slopes-----	620	*
5076	Daklos-Catahoula complex, 2 to 30 percent slopes-----	7,176	0.4
5077	Gompers family-Rock outcrop (Straight Cliffs Formation)-Sheecal family complex, 50 to 80 percent slopes-----	2,604	0.1
5078	Arabrab-Vessilla-Colskel complex, 2 to 15 percent slopes-----	32,023	1.7
5079	Colskel-Arabrab-Vessilla complex, 15 to 50 percent slopes-----	37,784	2.0
5080	Moffat-Moepitz complex, 2 to 25 percent slopes-----	3,808	0.2
5081	Badland and Rock outcrop (Straight Cliffs and Wahweap Formations)-Kydestea family complex, 50 to 80 percent slopes-----	52,108	2.8
5082	Colskel-Menefee-Arabrab complex, 2 to 15 percent slopes-----	18,944	1.0
5083	Colskel-Menefee complex, 15 to 50 percent slopes-----	35,021	1.8
5085	Hillburn very channery loam, 10 to 70 percent slopes-----	25,619	1.4
5086	Mespu-Bispen-Santrick complex, 2 to 15 percent slopes-----	24,732	1.3
5087	Kenzo, steep-Rock outcrop (Kayenta Formation) complex, 15 to 50 percent slopes-----	46,502	2.5
5088	Calcree-Bowington-Mespu complex, 0 to 20 percent slopes-----	2,341	0.1
5089	Bowington-Mespu complex, 0 to 15 percent slopes-----	2,957	0.2
5090	Baldfield clay, saline, 2 to 8 percent slopes-----	4,760	0.3
5091	Brumley fine sandy loam, 2 to 8 percent slopes-----	3,372	0.2
5092	Rock outcrop (Navajo Formation)-Navigon complex, 30 to 60 percent slopes-----	4,595	0.2
5093	Robay-Strell complex, 5 to 30 percent slopes-----	1,081	*
5094	Aridic Ustorthents-Yatne complex, 15 to 70 percent slopes-----	4,407	0.2
5095	Daklos-Hideout-Rock outcrop (Straight Cliffs Formation) complex, 2 to 15 percent slopes-----	49,804	2.6
5096	Daklos, steep-Rock outcrop (Straight Cliffs Formation) complex, 15 to 50 percent slopes-----	34,687	1.8
5097	Skyvillage-Daklos, saline-Rock outcrop (Wahweap Formation) complex, 2 to 15 percent slopes-----	7,824	0.4
5098	Daklos, saline-Skyvillage, saline-Cannonville complex, 15 to 50 percent slopes-----	27,727	1.5
5100	Rock outcrop (Wingate Formation)-Arches, dry complex, 2 to 10 percent slopes-----	6,017	0.3
5101	Polychrome family-Badland (Chinle Formation)-Gaddes family complex, 15 to 60 percent slopes-----	9,304	0.5
5102	Chinchin-Badland (Chinle Formation) complex, 25 to 50 percent slopes-----	10,430	0.6
5103	Barx-Remorris complex, 5 to 45 percent slopes-----	6,928	0.4
5104	Rock outcrop (Shinarump Conglomerate)-Hideout complex, 5 to 50 percent slopes-----	2,651	0.1
5105	Atchee-Lazear, dry-Rock outcrop (Shinarump Conglomerate) complex, 5 to 60 percent slopes-----	9,849	0.5
5106	Hillburn, dry-Badland (Moenkopi Formation) complex, 25 to 60 percent slopes-----	11,896	0.6
5107	Simel-Hillburn, dry complex, 5 to 45 percent slopes-----	14,878	0.8
5108	Hillburn, dry-Rock outcrop (Moenkopi Formation) complex, 10 to 60 percent slopes-----	7,802	0.4
5109	Nonip, dry-Rock outcrop (Moenkopi Formation) complex, 15 to 50 percent slopes-----	11,332	0.6
5110	Reef very channery sandy loam, 5 to 25 percent slopes-----	19,648	1.0
5111	Nonip extremely channery sandy loam, dry, 5 to 50 percent slopes-----	7,974	0.4
5112	Barx-Radnik, moist-Progresso, dry complex, 2 to 8 percent slopes-----	11,667	0.6

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
5114	Meriwhitica, moist-Mellenthin complex, 5 to 15 percent slopes-----	4,706	0.2
5115	Sanostee, warm-Daklos-Hideout complex, 2 to 15 percent slopes-----	1,893	*
5116	Stent-Minchey complex, 2 to 15 percent slopes-----	9,022	0.5
5117	Sheppard-Badland (Carmel and Entrada Formations) complex, 5 to 30 percent slopes-----	8,754	0.5
5118	Mido-Kenzo-Rock outcrop (Carmel Formation) complex, 2 to 30 percent slopes-----	13,154	0.7
5120	Pinepoint-Flatnose complex, 2 to 8 percent slopes-----	11,960	0.6
5121	Trail-Riverwash complex, 0 to 5 percent slopes-----	4,463	0.2
5122	Mido-Mivida complex, 2 to 15 percent slopes-----	7,888	0.4
5123	Billings-Jocity, saline complex, 0 to 8 percent slopes-----	2,879	0.2
5125	Clapper very gravelly loam, 2 to 15 percent slopes-----	890	*
5126	Pinepoint-Parkwash complex, 2 to 15 percent slopes-----	46,218	2.4
5127	Skyvillage-Mikim-Badland (Kaiparowits Formation) complex, 2 to 15 percent slopes-----	41,729	2.2
5128	Curecanti-Zibetod families complex, 30 to 70 percent slopes-----	2,989	0.2
5129	Skyvillage-Rock outcrop (Wahweap Formation) complex, 2 to 15 percent slopes-----	19,019	1.0
5130	Progresso-Begay, dry complex, 1 to 8 percent slopes-----	6,457	0.3
5131	Badland (Kaiparowits Formation)-Lazear, steep complex, 15 to 60 percent slopes-----	14,122	0.7
5132	Strych-Horsemountain-Barx complex, 2 to 15 percent slopes-----	11,675	0.6
5133	Menefee-Badland (Kaiparowits Formation) complex, 5 to 30 percent slopes-----	2,585	0.1
5136	Suzmayne-Colskel-Rock outcrop (Straight Cliffs Formation) complex, 10 to 40 percent slopes-----	10,192	0.5
5137	Casmos-Pariette families-Rock outcrop (Dakota and Morrison Formation) complex, 2 to 30 percent slopes-----	13,421	0.7
5138	Nakai-Sheppard complex, 2 to 15 percent slopes-----	9,040	0.5
5139	Hetz sandy loam, 0 to 3 percent slopes-----	98	*
5140	Green River-Radnik, moist-Suwanee, saline complex, 0 to 5 percent slopes-----	7,776	0.4
5141	Radnik, moist-Suwanee, saline-Escavada complex, 0 to 8 percent slopes----	14,949	0.8
5142	Alvey-Atrac complex, 1 to 15 percent slopes-----	10,827	0.6
5143	Elias-Mikim complex, 1 to 7 percent slopes-----	1,138	*
5144	Tsaya-Rock outcrop (Straight Cliffs Formation) complex, 10 to 60 percent slopes-----	28,505	1.5
5146	Moffat-Pagina-Sheppard complex, 2 to 20 percent slopes-----	5,321	0.3
5149	Tsaya, saline-Rock outcrop (Straight Cliffs Formation)-Lithic Torriorthents complex, 50 to 80 percent slopes-----	47,608	2.5
5150	Chipeta-Hanksville-Badland (Tropic Shale) complex, 2 to 30 percent slopes-----	14,674	0.8
5151	Pinepoint, dry-Tenneycanyon-Parkwash complex, 2 to 25 percent slopes----	27,679	1.5
5154	Dient-Crotoncanyon complex, 15 to 50 percent slopes-----	24,665	1.3
5155	Sanostee, warm-Milok-Lazear, warm complex, 2 to 15 percent slopes-----	9,938	0.5
5156	Daklos, steep-Fourmilebench complex, 15 to 50 percent slopes-----	11,522	0.6
5157	Daklos family-Rock outcrop (Wahweap Formation) complex, 50 to 80 percent slopes-----	43,273	2.3
5158	Mellenthin, moist-Rock outcrop (Moenkopi Formation) complex, 25 to 60 percent slopes-----	10,853	0.6
5159	Mellenthin, moist-Bowdish complex, 2 to 30 percent slopes-----	18,735	1.0
5160	Timpoweap-Evpark-Atarque complex, 2 to 15 percent slopes-----	17,362	0.9
5163	Horsemountain fine sandy loam, moist, 2 to 8 percent slopes-----	1,566	*
5164	Badland (Chinle Formation)-----	6,771	0.4
5166	Hillburn, dry-Sazi, moist complex, 2 to 30 percent slopes-----	3,814	0.2
5167	Progresso, cool-Atchee family complex, 2 to 15 percent slopes-----	2,741	0.1
5169	Lazear, steep-Simel-Rock outcrop (Carmel Formation) complex, 20 to 60 percent slopes-----	2,550	0.1
5170	Lemrac-Simel-Humbug, moist complex, 2 to 20 percent slopes-----	12,846	0.7
5171	Kenzo-Retsabal-Progresso, cool complex, 2 to 30 percent slopes-----	11,773	0.6
5172	Ruinpoint-Barx complex, 2 to 8 percent slopes-----	11,178	0.6

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
5173	Simel-Strych, moist-Kenzo complex, 2 to 20 percent slopes-----	3,004	0.2
5174	Strych-Sazi, moist complex, 15 to 50 percent slopes-----	12,936	0.7
5180	Pinepoint-Rock outcrop (Navajo Sandstone)-Parkwash complex, 15 to 50 percent slopes-----	53,018	2.8
5181	Parkelei-Plumasano, moist-Pinepoint complex, 2 to 15 percent slopes-----	40,593	2.1
5182	Arabrab-Colskel-Rock outcrop (Carmel Formation) complex, 15 to 50 percent slopes-----	24,203	1.3
5183	Parkwash-Rock outcrop (Navajo Sandstone)-Vessilla complex, 30 to 65 percent slopes-----	15,324	0.8
5185	Nomrah-Upler complex, 2 to 15 percent slopes-----	10,506	0.6
5186	Bodot, cool-Sili complex, 2 to 8 percent slopes-----	3,603	0.2
5187	Zigzag-Aridic Ustorthents complex, 15 to 70 percent slopes-----	6,455	0.3
5188	Frandsen loam, 1 to 15 percent slopes-----	694	*
5189	Widtsoe-Emlin complex, 5 to 25 percent slopes-----	2,924	0.2
5190	Podo-Rock outcrop (Straight Cliffs and Wahweap Formations) complex, 15 to 50 percent slopes-----	5,991	0.3
5191	Ruko-Rock outcrop (Straight Cliffs and Wahweap Formations)-Podo complex, 30 to 70 percent slopes-----	17,453	0.9
5192	Gerst family-Cannonville-Rock outcrop (Straight Cliffs and Dakota Formation) complex, 20 to 50 percent slopes-----	10,511	0.6
5193	Badland (Kaiparowits Formation)-----	9,209	0.5
5195	Henrieville sandy loam, 2 to 8 percent slopes-----	4,337	0.2
5198	Bigpack clay loam, 1 to 8 percent slopes-----	719	*
5199	Quagmeier-Parkelei complex, 2 to 30 percent slopes-----	5,142	0.3
5200	Sojourn family-Retsabal-Colskel complex, 10 to 50 percent slopes-----	9,402	0.5
5201	Sojourn family-Aridic Ustorthents complex, 15 to 50 percent slopes-----	8,182	0.4
5203	Wiggler-Curecanti family, cool complex, 25 to 65 percent slopes-----	2,610	0.1
5205	Curecanti families, cool-Widtsoe complex, 2 to 25 percent slopes-----	186	*
5206	Upler cobbly loam, 5 to 50 percent slopes-----	1,066	*
5207	Winetti-Riverwash complex, 2 to 5 percent slopes-----	1,366	*
5210	Elpedro, moist-Flatnose complex, 2 to 8 percent slopes-----	6,967	0.4
5211	Yarts, moist-Sazi, moist complex, 2 to 8 percent slopes-----	3,316	0.2
	Total-----	1,894,373	100.0

\* Less than 0.1 percent.



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5006: Milok, cool-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass----- needle and thread----- fourwing saltbush----- galleta----- miscellaneous perennial grasses miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- miscellaneous perennial forbs-- winterfat-----	20 15 10 10 10 10 10 5 5 5
5007: Navajo Sandstone Rock outcrop-----	---	---	---	---	---	---
Nalcase-----	Semidesert Shallow Sand (Cutler Mormon tea)	575	375	175	Cutler Mormon tea----- Indian ricegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses Bigelow sagebrush----- Havard's oak----- mesa dropseed----- miscellaneous shrubs----- sand dropseed----- sand sagebrush----- shrub live oak----- spike dropseed-----	20 20 10 10 5 5 5 5 5 5 5 5
5008: Simel-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5
Simel, steep-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper----- Utah serviceberry----- roundleaf buffaloberry----- Indian ricegrass----- twoneedle pinyon----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- singleleaf ash-----	20 15 15 10 10 5 5 5 5 5 5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5011: Carmel Formation Badland	---	---	---	---	---	---
Rizno, cool-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5
Nonip-----	Semidesert Shallow Loam (Galleta-Utah Juniper)	725	475	375	Utah juniper----- Indian ricegrass----- blue grama----- Mexican cliffrose----- broom snakeweed----- galleta----- gooseberryleaf globemallow---- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	30 15 15 5 5 5 5 5 5 5
5012: Santrick-----	Semidesert Sandy Loam (Wyoming Big Sagebrush)	675	475	275	Indian ricegrass----- needle and thread----- Wyoming big sagebrush----- miscellaneous perennial grasses fourwing saltbush----- galleta----- green Mormon tea----- miscellaneous perennial forbs-- miscellaneous shrubs-----	20 20 15 15 10 5 5 5 5
Nalcasa-----	Semidesert Shallow Sand (Cutler Mormon tea)	575	375	175	Cutler Mormon tea----- Indian ricegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses Bigelow sagebrush----- Havard's oak----- mesa dropseed----- miscellaneous shrubs----- sand dropseed----- sand sagebrush----- shrub live oak----- spike dropseed-----	20 20 10 10 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5012: Bispen-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass----- fourwing saltbush----- galleta----- needle and thread----- miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- gooseberryleaf globemallow---- miscellaneous perennial forbs-- miscellaneous perennial grasses  sand buckwheat----- sand sagebrush-----	20 10 10 10 10 10 5 5 5 5 5 5
5013: Mido-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass----- fourwing saltbush----- galleta----- needle and thread----- miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- gooseberryleaf globemallow---- miscellaneous perennial forbs-- miscellaneous perennial grasses  sand buckwheat----- sand sagebrush-----	20 10 10 10 10 10 5 5 5 5 5 5
Yarts-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass----- needle and thread----- fourwing saltbush----- galleta----- miscellaneous perennial grasses  miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- miscellaneous perennial forbs--	20 15 10 10 10 10 10 5 5
5015: Mespun-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass----- fourwing saltbush----- galleta----- needle and thread----- miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- gooseberryleaf globemallow---- miscellaneous perennial forbs-- miscellaneous perennial grasses  sand buckwheat----- sand sagebrush-----	20 10 10 10 10 10 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5017: Skos, dry-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5
Mido-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass----- fourwing saltbush----- galleta----- needle and thread----- miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- gooseberryleaf globemallow----- miscellaneous perennial forbs-- miscellaneous perennial grasses sand buckwheat----- sand sagebrush-----	20 10 10 10 10 10 5 5 5 5 5 5
Arches, dry-----	Semidesert Shallow Sand (Utah Juniper-Pinyon)	325	225	125	Bigelow sagebrush----- Utah juniper----- miscellaneous perennial grasses roundleaf buffaloberry----- Indian ricegrass----- Mexican cliffrose----- Torrey Mormon tea----- Wright birdbeak----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous shrubs----- rubber rabbitbrush----- twoneedle pinyon-----	15 15 10 10 5 5 5 5 5 5 5 5 5
5018: Skos, dry-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5019: Skos, dry-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5
Page Sandstone, Carmel Formation Rock outcrop-	---	---	---	---	---	---
Arches, dry-----	Semidesert Shallow Sand (Utah Juniper-Pinyon)	325	225	125	Bigelow sagebrush----- Utah juniper----- miscellaneous perennial grasses roundleaf buffaloberry----- Indian ricegrass----- Mexican cliffrose----- Torrey Mormon tea----- Wright birdbeak----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous shrubs----- rubber rabbitbrush----- twoneedle pinyon-----	15 15 10 10 5 5 5 5 5 5 5 5 5
5020: Navajo Sandstone Rock outcrop-----	---	---	---	---	---	---
Mespu-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass----- fourwing saltbush----- galleta----- needle and thread----- miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- gooseberryleaf globemallow---- miscellaneous perennial forbs-- miscellaneous perennial grasses sand buckwheat----- sand sagebrush-----	20 10 10 10 10 10 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5020: Nalcasa-----	Semidesert Shallow Sand (Cutler Mormon tea)	575	375	175	Cutler Mormon tea-----	20
					Indian ricegrass-----	20
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					Bigelow sagebrush-----	5
					Havard's oak-----	5
					mesa dropseed-----	5
					miscellaneous shrubs-----	5
					sand dropseed-----	5
					sand sagebrush-----	5
					shrub live oak-----	5
					spike dropseed-----	5
5021: Milok, cool-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass-----	20
					needle and thread-----	15
					fourwing saltbush-----	10
					galleta-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					miscellaneous perennial forbs--	5
					winterfat-----	5
Anasazi, cool-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass-----	20
					needle and thread-----	15
					fourwing saltbush-----	10
					galleta-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					miscellaneous perennial forbs--	5
					winterfat-----	5
5023: Tsaya-----	Desert Shallow Sandy Loam (Blackbrush)	350	225	125	blackbrush-----	60
					Cutler Mormon tea-----	10
					galleta-----	10
					Indian ricegrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5025: Yarts-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass----- needle and thread----- fourwing saltbush----- galleta----- miscellaneous perennial grasses miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- miscellaneous perennial forbs-- winterfat-----	20 15 10 10 10 10 10 5 5 5
5026: Entrada and Carmel Formation Rock outcrop-	---	---	---	---	---	---
5027: Tropic Formation Shale Badland-----	---	---	---	---	---	---
Cannonville-----	Semidesert Shallow Clay (Shadscale-Utah Juniper)	300	150	50	Indian ricegrass----- galleta----- roundleaf buffaloberry----- shadscale----- bottlebrush squirreltail----- Utah juniper----- black sagebrush----- crispleaf buckwheat----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	15 15 15 15 10 5 5 5 5 5 5
Dakota Formation Rock outcrop-----	---	---	---	---	---	---
5028: Cannonville Member, Entrada Formation Badland-----	---	---	---	---	---	---
5029: Straight Cliffs Formation Rock outcrop-	---	---	---	---	---	---
Atchee family, steep---	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper----- Utah serviceberry----- roundleaf buffaloberry----- Indian ricegrass----- twoneedle pinyon----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- singleleaf ash-----	20 15 15 10 10 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5029: Chilton family-----	Semidesert Gravelly Loam (Utah Juniper-Pinyon)	775	525	375	Utah juniper-----	15
					miscellaneous shrubs-----	15
					Indian ricegrass-----	10
					fourwing saltbush-----	10
					galleta-----	10
					Torrey Mormon tea-----	5
					blue grama-----	5
					broom snakeweed-----	5
					grassy rockgoldenrod-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					twoneedle pinyon-----	5
5030: Catahoula-----	Semidesert Stony Loam (Utah Juniper-Pinyon)	400	300	200	Indian ricegrass-----	15
					Utah juniper-----	15
					galleta-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					roundleaf buffaloberry-----	10
					Wyoming big sagebrush-----	5
					broom snakeweed-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					twoneedle pinyon-----	5
Clapper, dry-----	Semidesert Stony Loam (Utah Juniper-Pinyon)	400	300	200	Indian ricegrass-----	15
					Utah juniper-----	15
					galleta-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					roundleaf buffaloberry-----	10
					Wyoming big sagebrush-----	5
					broom snakeweed-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					twoneedle pinyon-----	5
5031: Moclom-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5031: Morrison Formation Rock outcrop-----	---	---	---	---	---	---
5032: Remorris-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper----- Utah serviceberry----- roundleaf buffaloberry----- Indian ricegrass----- twoneedle pinyon----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- singleleaf ash-----	20 15 15 10 10 5 5 5 5 5 5
Kenzo, steep-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper----- Utah serviceberry----- roundleaf buffaloberry----- Indian ricegrass----- twoneedle pinyon----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- singleleaf ash-----	20 15 15 10 10 5 5 5 5 5 5
Morrison and Entrada Formation Rock outcrop-	---	---	---	---	---	---
5033: Yarts, eroded-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass----- needle and thread----- fourwing saltbush----- galleta----- miscellaneous perennial grasses miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- miscellaneous perennial forbs-- winterfat-----	20 15 10 10 10 10 10 5 5 5
5034: Nonip-----	Semidesert Shallow Loam (Galleta-Utah Juniper)	725	475	375	Utah juniper----- Indian ricegrass----- blue grama----- Mexican cliffrose----- broom snakeweed----- galleta----- gooseberryleaf globemallow---- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	30 15 15 5 5 5 5 5 5 5 5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5040: Sazi-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass-----	20
					needle and thread-----	15
					fourwing saltbush-----	10
					galleta-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					miscellaneous perennial forbs--	5
					winterfat-----	5
Milok, cool-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass-----	20
					needle and thread-----	15
					fourwing saltbush-----	10
					galleta-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					miscellaneous perennial forbs--	5
					winterfat-----	5
5041: Seeg, warm-----	Desert Stony Loam (Blackbrush)	450	250	150	blackbrush-----	40
					galleta-----	20
					miscellaneous perennial forbs--	10
					Torrey Mormon tea-----	5
					broom snakeweed-----	5
					fourwing saltbush-----	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					shadscale-----	5
Pagina-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
5042: Moenkopie, warm-----	Desert Shallow Sandy Loam (Blackbrush)	350	225	125	blackbrush-----	60
					Cutler Mormon tea-----	10
					galleta-----	10
					Indian ricegrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5042: Moepitz-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Carmel Formation Rock outcrop-----	---	---	---	---	---	---
5043: Daklos, steep-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper-----	20
					Utah serviceberry-----	15
					roundleaf buffaloberry-----	15
					Indian ricegrass-----	10
					twoneedle pinyon-----	10
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					singleleaf ash-----	5
Morrison Formation and Romano Mesa Sandstone Rock outcrop-----	---	---	---	---	---	---
5044: Dient-----	Desert Stony Loam (Blackbrush)	450	250	150	blackbrush-----	40
					galleta-----	20
					miscellaneous perennial forbs--	10
					Torrey Mormon tea-----	5
					broom snakeweed-----	5
					fourwing saltbush-----	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					shadscale-----	5
5046: Moffat-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5046: Sheppard-----	Desert Sand (Sand Sagebrush)	695	385	185	Indian ricegrass----- sand dropseed----- miscellaneous perennial forbs-- miscellaneous perennial grasses sand sagebrush----- Cutler Mormon tea----- fourwing saltbush----- gooseberryleaf globemallow----- miscellaneous shrubs----- sand buckwheat----- sandhill muhly-----	25 15 10 10 10 5 5 5 5 5 5
Nakai-----	Desert Sandy Loam (Fourwing Saltbush)	525	425	275	Indian ricegrass----- galleta----- fourwing saltbush----- miscellaneous perennial forbs-- miscellaneous perennial grasses gooseberryleaf globemallow----- mesa dropseed----- miscellaneous shrubs----- painted milkvetch----- sand dropseed----- spike dropseed-----	25 15 10 10 10 5 5 5 5 5 5
5047: Moffat-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush----- Indian ricegrass----- Cutler Mormon tea----- Fremont indigobush----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	60 10 5 5 5 5 5 5
Seeg, warm-----	Desert Stony Loam (Blackbrush)	450	250	150	blackbrush----- galleta----- miscellaneous perennial forbs-- Torrey Mormon tea----- broom snakeweed----- fourwing saltbush----- miscellaneous perennial grasses miscellaneous shrubs----- shadscale-----	40 20 10 5 5 5 5 5 5
Mack, moist-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush----- Indian ricegrass----- Cutler Mormon tea----- Fremont indigobush----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	60 10 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5049: Moffat-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Mack, moist-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
5050: Daklos-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5
Arches, dry-----	Semidesert Shallow Sand (Utah Juniper-Pinyon)	325	225	125	Bigelow sagebrush-----	15
					Utah juniper-----	15
					miscellaneous perennial grasses	10
					roundleaf buffaloberry-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Torrey Mormon tea-----	5
					Wright birdbeak-----	5
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					rubber rabbitbrush-----	5
					twoneedle pinyon-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5052: Yarts-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass----- needle and thread----- fourwing saltbush----- galleta----- miscellaneous perennial grasses miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- miscellaneous perennial forbs-- winterfat-----	20 15 10 10 10 10 10 5 5 5
Suwanee-----	Sandy Bottom (Fourwing Saltbush)	850	600	350	Indian ricegrass----- galleta----- fourwing saltbush----- miscellaneous perennial grasses green Mormon tea----- miscellaneous perennial forbs-- miscellaneous shrubs----- sand dropseed----- scarlet globemallow----- winterfat-----	25 20 15 10 5 5 5 5 5 5
5053: Milok-----	Semidesert Sandy Loam (Blackbrush)	675	475	275	blackbrush----- Indian ricegrass----- Cutler Mormon tea----- fourwing saltbush----- galleta----- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	50 15 5 5 5 5 5 5 5
5055: Mivida-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass----- needle and thread----- fourwing saltbush----- galleta----- miscellaneous perennial grasses miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- miscellaneous perennial forbs-- winterfat-----	20 15 10 10 10 10 10 5 5 5
Barx, dry-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass----- needle and thread----- fourwing saltbush----- galleta----- miscellaneous perennial grasses miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- miscellaneous perennial forbs-- winterfat-----	20 15 10 10 10 10 10 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5057: Arches, dry-----	Semidesert Shallow Sand (Utah Juniper-Pinyon)	325	225	125	Bigelow sagebrush-----	15
					Utah juniper-----	15
					miscellaneous perennial grasses	10
					roundleaf buffaloberry-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Torrey Mormon tea-----	5
					Wright birdbeak-----	5
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					rubber rabbitbrush-----	5
twoneedle pinyon-----	5					
Mident-----	Semidesert Shallow Sand (Utah Juniper-Pinyon)	325	225	125	Bigelow sagebrush-----	15
					Utah juniper-----	15
					miscellaneous perennial grasses	10
					roundleaf buffaloberry-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Torrey Mormon tea-----	5
					Wright birdbeak-----	5
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					rubber rabbitbrush-----	5
twoneedle pinyon-----	5					
Yarts-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass-----	20
					needle and thread-----	15
					fourwing saltbush-----	10
					galleta-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					miscellaneous perennial forbs--	5
					winterfat-----	5
5058: Earlweed-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass-----	20
					fourwing saltbush-----	10
					galleta-----	10
					needle and thread-----	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					gooseberryleaf globemallow----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sand buckwheat-----	5
					sand sagebrush-----	5





Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5063: Moenkopie, warm-----	Desert Shallow Sandy Loam (Blackbrush)	350	225	125	blackbrush----- Cutler Mormon tea----- galleta----- Indian ricegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	60 10 10 5 5 5 5
Needle-----	Desert Shallow Sandy Loam (Blackbrush)	350	225	125	blackbrush----- Cutler Mormon tea----- galleta----- Indian ricegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	60 10 10 5 5 5 5
5065: Trail-----	Sandy Bottom (Fourwing Saltbush)	850	600	350	Indian ricegrass----- galleta----- fourwing saltbush----- miscellaneous perennial grasses gooseberryleaf globemallow---- green Mormon tea----- miscellaneous perennial forbs-- miscellaneous shrubs----- sand dropseed----- winterfat-----	25 20 15 10 5 5 5 5 5 5
Sheppard-----	Desert Sand (Sand Sagebrush)	695	385	185	Indian ricegrass----- sand dropseed----- miscellaneous perennial forbs-- miscellaneous perennial grasses sand sagebrush----- Cutler Mormon tea----- fourwing saltbush----- gooseberryleaf globemallow---- miscellaneous shrubs----- sand buckwheat----- sandhill muhly-----	25 15 10 10 10 5 5 5 5 5 5
5067: Ranion-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush----- Indian ricegrass----- Cutler Mormon tea----- Fremont indigobush----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	60 10 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5067: Peekaboo-----	Desert Sand (Sand Sagebrush)	695	385	185	Indian ricegrass-----	25
					sand dropseed-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					sand sagebrush-----	10
					Cutler Mormon tea-----	5
					fourwing saltbush-----	5
					gooseberryleaf globemallow----	5
					miscellaneous shrubs-----	5
					sand buckwheat-----	5
					sandhill muhly-----	5
5068: Seeg, warm-----	Desert Stony Loam (Blackbrush)	450	250	150	blackbrush-----	40
					galleta-----	20
					miscellaneous perennial forbs--	10
					Torrey Mormon tea-----	5
					broom snakeweed-----	5
					fourwing saltbush-----	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					shadscale-----	5
Moffat-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Needle-----	Desert Shallow Sandy Loam (Blackbrush)	350	225	125	blackbrush-----	60
					Cutler Mormon tea-----	10
					galleta-----	10
					Indian ricegrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
5069: Entrada Sandstone Rock outcrop-----	---	---	---	---	---	---
Nepalto, moist-----	Desert Sandy Loam (Fourwing Saltbush)	525	425	275	Indian ricegrass-----	25
					galleta-----	15
					fourwing saltbush-----	10
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					gooseberryleaf globemallow----	5
					mesa dropseed-----	5
					miscellaneous shrubs-----	5
					painted milkvetch-----	5
					sand dropseed-----	5
					spike dropseed-----	5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5074: Vessilla-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush-----	15
					twoneedle pinyon-----	15
					Utah juniper-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Sandberg Bluegrass-----	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					yellow rabbitbrush-----	5
5075: Shalona-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	600	mountain big sagebrush-----	30
					Indian ricegrass-----	10
					blue grama-----	10
					Gambel oak-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
5076: Daklos-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5
Catahoula-----	Semidesert Stony Loam (Utah Juniper-Pinyon)	400	300	200	Indian ricegrass-----	15
					Utah juniper-----	15
					galleta-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					roundleaf buffaloberry-----	10
					Wyoming big sagebrush-----	5
					broom snakeweed-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					twoneedle pinyon-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5077: Gompers family-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	500	250	Indian ricegrass----- black sagebrush----- twoneedle pinyon----- antelope bitterbrush----- mountain big sagebrush----- miscellaneous shrubs----- Utah juniper----- blue grama----- needleandthread----- miscellaneous perennial forbs-- miscellaneous perennial grasses	15 15 15 10 10 10 5 5 5 5 5
Straight Cliffs Formation Rock outcrop-	---	---	---	---	---	---
Sheecal family-----	Upland Stony Loam (Pinyon-Utah Juniper)	900	500	200	Indian ricegrass----- Sandberg Bluegrass----- antelope bitterbrush----- mountain big sagebrush----- miscellaneous shrubs----- twoneedle pinyon----- James' cryptantha----- Utah juniper----- black sagebrush----- blue grama----- bottlebrush squirreltail----- needleandthread----- miscellaneous perennial forbs-- miscellaneous perennial grasses	10 10 10 10 10 10 5 5 5 5 5 5 5
5078: Arabrab-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5078: Vessilla-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
Colskel-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
5079: Colskel-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
Arabrab-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5079: Vessilla-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush-----	15
					twoneedle pinyon-----	15
					Utah juniper-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Sandberg Bluegrass-----	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					yellow rabbitbrush-----	5
5080: Moffat-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Moepitz-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
5081: Straight Cliffs and Wahweap Formation Badland-----	---	---	---	---	---	---
Straight Cliffs and Wahweap Formation Rock outcrop-----	---	---	---	---	---	---
Kydestea family-----	Upland Very Steep Shallow Loam (Pinyon-Utah Juniper)	425	325	225	Utah juniper-----	15
					miscellaneous perennial grasses	15
					twoneedle pinyon-----	15
					Indian ricegrass-----	10
					Utah serviceberry-----	10
					miscellaneous shrubs-----	10
					Mexican cliffrose-----	5
					Salina wildrye-----	5
					alderleaf mountain-mahogany---	5
					green Mormon tea-----	5
					miscellaneous perennial forbs--	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5082: Colskel-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
Menefee-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
Arabrab-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
5083: Colskel-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5083: Menefee-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush-----	15
					twoneedle pinyon-----	15
					Utah juniper-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Sandberg Bluegrass-----	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					yellow rabbitbrush-----	5
5085: Hillburn-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5
5086: Mespun-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass-----	20
					fourwing saltbush-----	10
					galleta-----	10
					needle and thread-----	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					gooseberryleaf globemallow----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sand buckwheat-----	5
					sand sagebrush-----	5
Bispen-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass-----	20
					fourwing saltbush-----	10
					galleta-----	10
					needle and thread-----	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					gooseberryleaf globemallow----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sand buckwheat-----	5
					sand sagebrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5086: Santrick-----	Semidesert Sandy Loam (Wyoming Big Sagebrush)	675	475	275	Indian ricegrass----- needle and thread----- Wyoming big sagebrush----- miscellaneous perennial grasses fourwing saltbush----- galleta----- green Mormon tea----- miscellaneous perennial forbs-- miscellaneous shrubs-----	20 20 15 15 10 5 5 5 5
5087: Kenzo, steep-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper----- Utah serviceberry----- roundleaf buffaloberry----- Indian ricegrass----- twoneedle pinyon----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- singleleaf ash-----	20 15 15 10 10 5 5 5 5 5 5
Kayenta Formation Rock outcrop-----	---	---	---	---	---	---
5088: Calcree-----	Semiwet Fresh Meadow	2,500	2,000	1,000	Kentucky bluegrass----- sedge----- miscellaneous perennial forbs-- Baltic rush----- basin wildrye----- common dandelion----- creeping bentgrass----- field horsetail----- miscellaneous perennial grasses miscellaneous shrubs----- plantain----- western wheatgrass-----	30 15 10 5 5 5 5 5 5 5 5 5
Bowington-----	Semiwet Fresh Streambank (Fremont Cottonwood)	1,550	1,350	1,200	Montana Wheatgrass----- coyote willow----- miscellaneous perennial grasses miscellaneous shrubs----- rubber rabbitbrush----- yellow willow----- Fremont cottonwood----- Kentucky bluegrass----- Louisiana sagewort----- Sandberg Bluegrass----- basin big sagebrush----- basin wildrye----- miscellaneous perennial forbs-- western wheatgrass-----	10 10 10 10 10 10 5 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5088: Mespun-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass-----	20
					fourwing saltbush-----	10
					galleta-----	10
					needle and thread-----	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					gooseberryleaf globemallow----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sand buckwheat-----	5
					sand sagebrush-----	5
5089: Bowington-----	Semiwet Fresh Streambank (Fremont Cottonwood)	1,550	1,350	1,200	Montana Wheatgrass-----	10
					coyote willow-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					rubber rabbitbrush-----	10
					yellow willow-----	10
					Fremont cottonwood-----	5
					Kentucky bluegrass-----	5
					Louisiana sagewort-----	5
					Sandberg Bluegrass-----	5
					basin big sagebrush-----	5
					basin wildrye-----	5
					miscellaneous perennial forbs--	5
					western wheatgrass-----	5
Mespun-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass-----	20
					fourwing saltbush-----	10
					galleta-----	10
					needle and thread-----	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					gooseberryleaf globemallow----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sand buckwheat-----	5
					sand sagebrush-----	5
5090: Baldfield, saline-----	Alkali Fan (Castlevalley Saltbush)	260	180	90	valley saltbush-----	25
					galleta-----	20
					shadscale-----	15
					Indian ricegrass-----	10
					greenmolly-----	10
					desert trumpet buckwheat-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5091: Brumley-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	600	mountain big sagebrush-----	30
					Indian ricegrass-----	10
					blue grama-----	10
					Gambel oak-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
5092: Navajo Sandstone Rock outcrop-----	---	---	---	---	---	---
Navigon-----	Semidesert Shallow Sand (Utah Juniper-Pinyon)	325	225	125	Bigelow sagebrush-----	15
					Utah juniper-----	15
					miscellaneous perennial grasses	10
					roundleaf buffaloberry-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Torrey Mormon tea-----	5
					Wright birdbeak-----	5
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					rubber rabbitbrush-----	5
					twoneedle pinyon-----	5
5093: Robay-----	Mountain Shallow Loam (Ponderosa Pine)	1,100	800	525	ponderosa pine-----	40
					greenleaf manzanita-----	10
					Gambel oak-----	5
					Indian ricegrass-----	5
					Sandberg Bluegrass-----	5
					Utah serviceberry-----	5
					elkweed-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					sedge-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5093: Strell-----	Mountain Shallow Loam (Ponderosa Pine)	1,100	800	525	ponderosa pine-----	40
					greenleaf manzanita-----	10
					Gambel oak-----	5
					Indian ricegrass-----	5
					Sandberg Bluegrass-----	5
					Utah serviceberry-----	5
					elkweed-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					sedge-----	5
5094: Aridic Ustorthents-----	Upland Steep Stony Loam (Utah Juniper-Pinyon)	625	425	275	Utah juniper-----	15
					twoneedle pinyon-----	15
					miscellaneous shrubs-----	10
					roundleaf buffaloberry-----	10
					Gambel oak-----	5
					Indian ricegrass-----	5
					Utah serviceberry-----	5
					alderleaf mountain-mahogany---	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					green Mormon tea-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Yatne-----	Upland Steep Stony Loam (Utah Juniper-Pinyon)	625	475	275	Utah juniper-----	15
					twoneedle pinyon-----	15
					miscellaneous shrubs-----	10
					roundleaf buffaloberry-----	10
					Gambel oak-----	5
					Indian ricegrass-----	5
					Utah serviceberry-----	5
					alderleaf mountain-mahogany---	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					green Mormon tea-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
5095: Daklos-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5095: Hideout-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5
Straight Cliffs Formation Sandstone Rock outcrop-----	---	---	---	---	---	---
5096: Daklos, steep-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper-----	20
					Utah serviceberry-----	15
					roundleaf buffaloberry-----	15
					Indian ricegrass-----	10
					twoneedle pinyon-----	10
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					singleleaf ash-----	5
Straight Cliffs Formation Sandstone Rock outcrop-----	---	---	---	---	---	---
5097: Skyvillage-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5100: Arches, dry-----	Semidesert Shallow Sand (Utah Juniper-Pinyon)	325	225	125	Bigelow sagebrush-----	15
					Utah juniper-----	15
					miscellaneous perennial grasses	10
					roundleaf buffaloberry-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Torrey Mormon tea-----	5
					Wright birdbeak-----	5
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					rubber rabbitbrush-----	5
					twoneedle pinyon-----	5
5101: Polychrome family-----	Semidesert Stony Loam (Utah Juniper-Pinyon)	400	300	200	Indian ricegrass-----	15
					Utah juniper-----	15
					galleta-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					roundleaf buffaloberry-----	10
					Wyoming big sagebrush-----	5
					broom snakeweed-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					twoneedle pinyon-----	5
Chinle Formation Badland	---	---	---	---	---	---
Gaddes family-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper-----	20
					Utah serviceberry-----	15
					roundleaf buffaloberry-----	15
					Indian ricegrass-----	10
					twoneedle pinyon-----	10
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					singleleaf ash-----	5
5102: Chinchin-----	Semidesert Shallow Clay (Shadscale-Utah Juniper)	300	150	50	Indian ricegrass-----	15
					galleta-----	15
					roundleaf buffaloberry-----	15
					shadscale-----	15
					bottlebrush squirreltail-----	10
					Utah juniper-----	5
					black sagebrush-----	5
					crispleaf buckwheat-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5102: Chinle Formation Badland	---	---	---	---	---	---
5103: Barx-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5
Remorris-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper----- Utah serviceberry----- roundleaf buffaloberry----- Indian ricegrass----- twoneedle pinyon----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- singleleaf ash-----	20 15 15 10 10 5 5 5 5 5 5
5104: Shinarump Member, Chinle Formation Rock outcrop	---	---	---	---	---	---
Hideout-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5
5105: Atchee-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5105: Lazear, dry-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5
Shinarump Member, Chinle Formation Rock outcrop	---	---	---	---	---	---
5106: Hillburn, dry-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5
Moenkopi Formation Badland-----	---	---	---	---	---	---
5107: Simel-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5110: Reef-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5
5111: Nonip, dry-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5
5112: Barx-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5
Radnik, moist-----	Loamy Bottom (Basin Big Sagebrush)	2,000	1,600	1,000	basin big sagebrush----- basin wildrye----- Indian ricegrass----- miscellaneous perennial grasses rubber rabbitbrush----- Sandberg Bluegrass----- fourwing saltbush----- muttongrass----- miscellaneous perennial forbs-- miscellaneous shrubs----- western wheatgrass-----	25 15 10 10 10 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5112: Progresso, dry-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass-----	20
					needle and thread-----	15
					fourwing saltbush-----	10
					galleta-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					miscellaneous perennial forbs--	5
					winterfat-----	5
5114: Meriwitica, moist-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5
Mellenthin-----	Semidesert Shallow Loam (Galleta-Utah Juniper)	725	475	375	Utah juniper-----	30
					Indian ricegrass-----	15
					blue grama-----	15
					Mexican cliffrose-----	5
					broom snakeweed-----	5
					galleta-----	5
					gooseberryleaf globemallow----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
5115: Sanostee, warm-----	Semidesert Sandy Loam (Spiny Hopsage)	650	550	450	spiny hopsage-----	45
					Cutler Mormon tea-----	5
					Douglas' dustymaiden-----	5
					Indian ricegrass-----	5
					blackbrush-----	5
					blue grama-----	5
					galleta-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					sand dropseed-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5115: Daklos-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5
Hideout-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5
5116: Stent-----	Desert Stony Loam (Shadscale-Bud Sagebrush)	575	475	275	galleta----- shadscale----- bud sagebrush----- miscellaneous shrubs----- Bigelow sagebrush----- Indian ricegrass----- Torrey Mormon tea----- miscellaneous perennial forbs-- miscellaneous perennial grasses sand dropseed----- woolly locoweed-----	25 20 10 10 5 5 5 5 5 5 5
Minchey-----	Desert Loam (Shadscale)	525	425	225	shadscale----- galleta----- Indian ricegrass----- Nevada Mormon tea----- broom snakeweed----- bud sagebrush----- gooseberryleaf globemallow----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- winterfat-----	30 20 10 5 5 5 5 5 5 5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5120: Pinepoint-----	Upland Sand (Mountain Big Sagebrush)	800	600	400	mountain big sagebrush-----	20
					blue grama-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					rubber rabbitbrush-----	10
					sand sagebrush-----	10
					Gambel oak-----	5
					Indian ricegrass-----	5
					broom snakeweed-----	5
					green Mormon tea-----	5
					miscellaneous perennial forbs--	5
					sandhill muhly-----	5
Flatnose-----	Loamy Bottom (Basin Big Sagebrush)	2,000	1,600	1,000	basin big sagebrush-----	25
					basin wildrye-----	15
					Indian ricegrass-----	10
					miscellaneous perennial grasses	10
					rubber rabbitbrush-----	10
					Sandberg Bluegrass-----	5
					fourwing saltbush-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
5121: Trail-----	Sandy Bottom (Fourwing Saltbush)	850	600	350	Indian ricegrass-----	25
					galleta-----	20
					fourwing saltbush-----	15
					miscellaneous perennial grasses	10
					green Mormon tea-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					sand dropseed-----	5
					scarlet globemallow-----	5
					winterfat-----	5
Riverwash-----	---	---	---	---	---	---
5122: Mido-----	Semidesert Sand (Fourwing Saltbush)	775	575	275	Indian ricegrass-----	20
					fourwing saltbush-----	10
					galleta-----	10
					needle and thread-----	10
					miscellaneous shrubs-----	10
					sand dropseed-----	10
					Cutler Mormon tea-----	5
					gooseberryleaf globemallow----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sand buckwheat-----	5
					sand sagebrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5122: Mivida-----	Semidesert Sandy Loam (Fourwing Saltbush)	675	475	275	Indian ricegrass----- needle and thread----- fourwing saltbush----- galleta----- miscellaneous perennial grasses miscellaneous shrubs----- sand dropseed----- Cutler Mormon tea----- miscellaneous perennial forbs-- winterfat-----	20 15 10 10 10 10 10 5 5 5
5123: Billings-----	Alkali Bottom (Greasewood)	850	750	650	greasewood----- alkali sacaton----- miscellaneous perennial forbs-- miscellaneous shrubs----- Torrey seepweed----- bottlebrush squirreltail----- miscellaneous perennial grasses sand dropseed-----	45 15 10 10 5 5 5 5
Jocity, saline-----	Alkali Bottom (Greasewood)	850	750	650	greasewood----- alkali sacaton----- miscellaneous perennial forbs-- miscellaneous shrubs----- Torrey seepweed----- bottlebrush squirreltail----- miscellaneous perennial grasses sand dropseed-----	45 15 10 10 5 5 5 5
5125: Clapper-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5
5126: Pinepoint-----	Upland Sand (Mountain Big Sagebrush)	800	600	400	mountain big sagebrush----- blue grama----- miscellaneous perennial grasses miscellaneous shrubs----- rubber rabbitbrush----- sand sagebrush----- Gambel oak----- Indian ricegrass----- broom snakeweed----- green Mormon tea----- miscellaneous perennial forbs-- sandhill muhly-----	20 10 10 10 10 10 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5126: Parkwash-----	Upland Shallow Sand (Pinyon-Utah Juniper)	450	350	250	Utah juniper----- twoneedle pinyon----- Indian ricegrass----- green Mormon tea----- mountain big sagebrush----- pointleaf manzanita----- antelope bitterbrush----- blue grama----- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	15 15 10 10 10 10 5 5 5 5 5 5
5127: Skyvillage-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5
Mikim-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5
Kaiparowits Formation Badland-----	---	---	---	---	---	---
5128: Curecanti family-----	Mountain Stony Loam (Oak)	1,875	1,400	1,000	mountain brome----- Gambel oak----- Sandberg Bluegrass----- antelope bitterbrush----- muttongrass----- miscellaneous perennial forbs-- mountain big sagebrush----- miscellaneous perennial grasses miscellaneous shrubs-----	20 15 15 15 10 10 5 5 5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5131: Lazear, steep-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper----- Utah serviceberry----- roundleaf buffaloberry----- Indian ricegrass----- twoneedle pinyon----- broom snakeweed----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- singleleaf ash-----	20 15 15 10 10 5 5 5 5 5 5
5132: Strych-----	Semidesert Stony Loam (Utah Juniper-Pinyon)	400	300	200	Indian ricegrass----- Utah juniper----- galleta----- green Mormon tea----- miscellaneous shrubs----- roundleaf buffaloberry----- Wyoming big sagebrush----- broom snakeweed----- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses twoneedle pinyon-----	15 15 10 10 10 10 5 5 5 5 5 5
Horsemountain-----	Semidesert Shallow Hardpan (Utah Juniper- Pinyon)	400	300	200	Utah juniper----- Indian ricegrass----- Wyoming big sagebrush----- green Mormon tea----- twoneedle pinyon----- Mexican cliffrose----- blue grama----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- purple threeawn----- roundleaf buffaloberry-----	20 10 10 10 10 5 5 5 5 5 5 5
Barx-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5137: Casmos family-----	Desert Shallow Loam (Shadscale)	290	240	90	shadscale----- galleta----- Indian ricegrass----- Nevada Mormon tea----- miscellaneous shrubs----- fineleaf hymenopappus----- gooseberryleaf globemallow----- miscellaneous perennial forbs-- miscellaneous perennial grasses	30 20 10 10 10 5 5 5 5
Pariette family-----	Desert Loam (Shadscale)	525	425	225	shadscale----- galleta----- Indian ricegrass----- Nevada Mormon tea----- broom snakeweed----- bud sagebrush----- gooseberryleaf globemallow----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- winterfat-----	30 20 10 5 5 5 5 5 5 5 5
Dakota and Morrison Formation Rock outcrop-	---	---	---	---	---	---
5138: Nakai-----	Desert Sandy Loam (Fourwing Saltbush)	525	425	275	Indian ricegrass----- galleta----- fourwing saltbush----- miscellaneous perennial forbs-- miscellaneous perennial grasses gooseberryleaf globemallow----- mesa dropseed----- miscellaneous shrubs----- painted milkvetch----- sand dropseed----- spike dropseed-----	25 15 10 10 10 5 5 5 5 5 5
Sheppard-----	Desert Sand (Sand Sagebrush)	695	385	185	Indian ricegrass----- sand dropseed----- miscellaneous perennial forbs-- miscellaneous perennial grasses sand sagebrush----- Cutler Mormon tea----- fourwing saltbush----- gooseberryleaf globemallow----- miscellaneous shrubs----- sand buckwheat----- sandhill muhly-----	25 15 10 10 10 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5139: Hetz-----	Semiwet Fresh Meadow	2,500	2,000	1,000	Kentucky bluegrass-----	30
					sedge-----	15
					miscellaneous perennial forbs--	10
					Baltic rush-----	5
					basin wildrye-----	5
					common dandelion-----	5
					creeping bentgrass-----	5
					field horsetail-----	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					plantain-----	5
					western wheatgrass-----	5
5140: Green River-----	Semiwet Saline Streambank (Fremont Cottonwood)	1,750	1,250	850	alkali sacaton-----	30
					coyote willow-----	20
					desert saltgrass-----	15
					Indian ricegrass-----	10
					Fremont cottonwood-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					rubber rabbitbrush-----	5
Radnik, moist-----	Loamy Bottom (Basin Big Sagebrush)	2,000	1,600	1,000	basin big sagebrush-----	25
					basin wildrye-----	15
					Indian ricegrass-----	10
					miscellaneous perennial grasses	10
					rubber rabbitbrush-----	10
					Sandberg Bluegrass-----	5
					fourwing saltbush-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
Suwanee, saline-----	Alkali Bottom (Greasewood)	850	750	650	greasewood-----	45
					alkali sacaton-----	15
					miscellaneous perennial forbs--	10
					miscellaneous shrubs-----	10
					Torrey seepweed-----	5
					bottlebrush squirreltail-----	5
					miscellaneous perennial grasses	5
					sand dropseed-----	5
5141: Radnik, moist-----	Loamy Bottom (Basin Big Sagebrush)	2,000	1,600	1,000	basin big sagebrush-----	25
					basin wildrye-----	15
					Indian ricegrass-----	10
					miscellaneous perennial grasses	10
					rubber rabbitbrush-----	10
					Sandberg Bluegrass-----	5
					fourwing saltbush-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5141: Escavada-----	Loamy Bottom (Basin Big Sagebrush)	2,000	1,600	1,000	basin big sagebrush-----	25
					basin wildrye-----	15
					Indian ricegrass-----	10
					miscellaneous perennial grasses	10
					rubber rabbitbrush-----	10
					Sandberg Bluegrass-----	5
					fourwing saltbush-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
Suwanee, saline-----	Alkali Bottom (Greasewood)	850	750	650	greasewood-----	45
					alkali sacaton-----	15
					miscellaneous perennial forbs--	10
					miscellaneous shrubs-----	10
					Torrey seepweed-----	5
					bottlebrush squirreltail-----	5
					miscellaneous perennial grasses	5
					sand dropseed-----	5
5142: Alvey-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush-----	20
					miscellaneous shrubs-----	20
					Indian ricegrass-----	15
					galleta-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					bottlebrush squirreltail-----	5
					winterfat-----	5
Atrac-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush-----	20
					miscellaneous shrubs-----	20
					Indian ricegrass-----	15
					galleta-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					bottlebrush squirreltail-----	5
					winterfat-----	5
5143: Elias-----	Alkali Flat (Greasewood)	950	750	550	greasewood-----	30
					bottlebrush squirreltail-----	10
					miscellaneous perennial forbs--	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					alkali sacaton-----	5
					basin big sagebrush-----	5
					galleta-----	5
					globemallow-----	5
					miscellaneous perennial grasses	5
					sand dropseed-----	5
					shadscale-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5143: Mikim-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush-----	20
					miscellaneous shrubs-----	20
					Indian ricegrass-----	15
					galleta-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					bottlebrush squirreltail-----	5
					winterfat-----	5
5144: Tsaya-----	Desert Shallow Sandy Loam (Blackbrush)	350	225	125	Blackbrush-----	60
					Cutler Mormon tea-----	10
					galleta-----	10
					Indian ricegrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Straight Cliffs Formation Burnt Sandstone Rock outcrop-	---	---	---	---	---	---
5146: Moffat-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Pagina-----	Desert Sandy Loam (Blackbrush)	475	400	325	blackbrush-----	60
					Indian ricegrass-----	10
					Cutler Mormon tea-----	5
					Fremont indigobush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Sheppard-----	Desert Sand (Sand Sagebrush)	695	385	185	Indian ricegrass-----	25
					sand dropseed-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					sand sagebrush-----	10
					Cutler Mormon tea-----	5
					fourwing saltbush-----	5
					gooseberryleaf globemallow----	5
					miscellaneous shrubs-----	5
					sand buckwheat-----	5
					sandhill muhly-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5149: Tsaya, saline-----	Desert Shallow Loam (Shadscale)	290	240	90	shadscale-----	30
					galleta-----	20
					Indian ricegrass-----	10
					Nevada Mormon tea-----	10
					miscellaneous shrubs-----	10
					fineleaf hymenopappus-----	5
					gooseberryleaf globemallow----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Straight Cliffs Formation Rock outcrop-	---	---	---	---	---	---
Lithic Torriorthents----	Desert Shallow Loam (Shadscale)	290	240	90	shadscale-----	30
					galleta-----	20
					Indian ricegrass-----	10
					Nevada Mormon tea-----	10
					miscellaneous shrubs-----	10
					fineleaf hymenopappus-----	5
					gooseberryleaf globemallow----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
5150: Chipeta-----	Desert Shallow Clay (Mat Saltbush)	340	190	140	mat saltbush-----	65
					galleta-----	10
					miscellaneous shrubs-----	10
					desert trumpet buckwheat-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Hanksville-----	Desert Shallow Clay (Mat Saltbush)	340	190	140	mat saltbush-----	65
					galleta-----	10
					miscellaneous shrubs-----	10
					desert trumpet buckwheat-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Tropic Formation Shale Badland-----	---	---	---	---	---	---
5151: Pinepoint, dry-----	Upland Sand (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	15
					broom snakeweed-----	10
					green Mormon tea-----	10
					mountain big sagebrush-----	10
					miscellaneous shrubs-----	10
					twoneedle pinyon-----	10
					Indian ricegrass-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sandhill muhly-----	5
					sixweeks fescue-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5151: Tenneycanyon-----	Upland Sand (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- mountain big sagebrush----- miscellaneous shrubs----- twoneedle pinyon----- Indian ricegrass----- antelope bitterbrush----- bottlebrush squirreltail----- miscellaneous perennial forbs-- miscellaneous perennial grasses sandhill muhly----- sixweeks fescue-----	15 10 10 10 10 10 5 5 5 5 5 5 5
Parkwash-----	Upland Shallow Sand (Pinyon-Utah Juniper)	450	350	250	Utah juniper----- twoneedle pinyon----- Indian ricegrass----- green Mormon tea----- mountain big sagebrush----- pointleaf manzanita----- antelope bitterbrush----- blue grama----- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	15 15 10 10 10 10 5 5 5 5 5 5
5154: Dient-----	Desert Stony Loam (Blackbrush)	450	250	150	blackbrush----- galleta----- miscellaneous perennial forbs-- Torrey Mormon tea----- broom snakeweed----- fourwing saltbush----- miscellaneous perennial grasses miscellaneous shrubs----- shadscale-----	40 20 10 5 5 5 5 5 5
Crotoncanyon-----	Desert Shallow Loam (Shadscale)	290	240	90	shadscale----- galleta----- Indian ricegrass----- Nevada Mormon tea----- miscellaneous shrubs----- fineleaf hymenopappus----- gooseberryleaf globemallow---- miscellaneous perennial forbs-- miscellaneous perennial grasses	30 20 10 10 10 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5155: Sanostee, warm-----	Semidesert Sandy Loam (Spiny Hopsage)	650	550	450	spiny hopsage-----	45
					Cutler Mormon tea-----	5
					Douglas' dustymaiden-----	5
					Indian ricegrass-----	5
					blackbrush-----	5
					blue grama-----	5
					galleta-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					sand dropseed-----	5
Milok-----	Semidesert Sandy Loam (Blackbrush)	675	475	275	blackbrush-----	50
					Indian ricegrass-----	15
					Cutler Mormon tea-----	5
					fourwing saltbush-----	5
					galleta-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Lazear, warm-----	Semidesert Shallow Sandy Loam (Blackbrush)	475	325	125	blackbrush-----	65
					Bigelow sagebrush-----	5
					Indian ricegrass-----	5
					Torrey Mormon tea-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
5156: Daklos, steep-----	Semidesert Steep Shallow Loam (Utah Juniper- Pinyon)	325	225	125	Utah juniper-----	20
					Utah serviceberry-----	15
					roundleaf buffaloberry-----	15
					Indian ricegrass-----	10
					twoneedle pinyon-----	10
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					singleleaf ash-----	5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5159: Mellenthin, moist-----	Semidesert Shallow Loam (Black Sagebrush)	475	375	275	black sagebrush-----	35
					Indian ricegrass-----	10
					Utah juniper-----	10
					Mexican cliffrose-----	5
					blue grama-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					fourwing saltbush-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Bowdish-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush-----	20
					miscellaneous shrubs-----	20
					Indian ricegrass-----	15
					galleta-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					bottlebrush squirreltail-----	5
					winterfat-----	5
5160: Timpoweap-----	Upland Shallow Loam (Cliffrose)	550	450	350	mountain big sagebrush-----	30
					Mexican cliffrose-----	15
					Utah juniper-----	15
					Indian ricegrass-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					twoneedle pinyon-----	5
Evpark-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	600	mountain big sagebrush-----	30
					Indian ricegrass-----	10
					blue grama-----	10
					Gambel oak-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5160: Atarque-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
5163: Horsemountain, moist----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5
5164: Chinle Formation Badland	---	---	---	---	---	---
5166: Hillburn, dry-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5
Sazi, moist-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5167: Progresso, cool-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush-----	20
					miscellaneous shrubs-----	20
					Indian ricegrass-----	15
					galleta-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					bottlebrush squirreltail-----	5
					winterfat-----	5
Atchee family-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5
5169: Lazear, steep-----	Semidesert Steep Shallow Loam (Utah Juniper-- Pinyon)	325	225	125	Utah juniper-----	20
					Utah serviceberry-----	15
					roundleaf buffaloberry-----	15
					Indian ricegrass-----	10
					twoneedle pinyon-----	10
					broom snakeweed-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					singleleaf ash-----	5
Simel-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia-----	15
					Utah juniper-----	15
					broom snakeweed-----	10
					galleta-----	10
					green Mormon tea-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					plains pricklypear-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5169: Carmel Formation Rock outcrop-----	---	---	---	---	---	---
5170: Lemrac-----	Semidesert Shallow Gypsum (Mormon tea)	450	350	250	Indian ricegrass----- Torrey Mormon tea----- broom snakeweed----- Brenda's yellow cryptantha---- Fremont's mahonia----- Mexican cliffrose----- Utah juniper----- bottlebrush squirreltail----- crispleaf buckwheat----- galleta----- green Mormon tea----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- twoneedle pinyon----- yellow rabbitbrush-----	15 10 10 5 5 5 5 5 5 5 5 5 5 5 5 5
Simel-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia----- Utah juniper----- broom snakeweed----- galleta----- green Mormon tea----- Indian ricegrass----- Mexican cliffrose----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains pricklypear----- twoneedle pinyon----- yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5
Humbug, moist-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5171: Kenzo-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper----- broom snakeweed----- green Mormon tea----- Fremont's mahonia----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- roundleaf buffaloberry----- twoneedle pinyon----- yellow rabbitbrush-----	35 10 10 5 5 5 5 5 5 5 5
Retsabal-----	Semidesert Shallow Gypsum (Mormon tea)	450	350	250	Indian ricegrass----- Torrey Mormon tea----- broom snakeweed----- Brenda's yellow cryptantha----- Fremont's mahonia----- Mexican cliffrose----- Utah juniper----- bottlebrush squirreltail----- crispleaf buckwheat----- galleta----- green Mormon tea----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- twoneedle pinyon----- yellow rabbitbrush-----	15 10 10 5 5 5 5 5 5 5 5 5 5 5 5
Progresso, cool-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5
5172: Ruinpoint-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5172: Barx-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush-----	20
					miscellaneous shrubs-----	20
					Indian ricegrass-----	15
					galleta-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					bottlebrush squirreltail-----	5
					winterfat-----	5
5173: Simel-----	Semidesert Shallow Shale (Utah Juniper-Pinyon)	325	225	125	Fremont's mahonia-----	15
					Utah juniper-----	15
					broom snakeweed-----	10
					galleta-----	10
					green Mormon tea-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					plains pricklypear-----	5
					twoneedle pinyon-----	5
	yellow rabbitbrush-----	5				
Strych, moist-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush-----	20
					miscellaneous shrubs-----	20
					Indian ricegrass-----	15
					galleta-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					bottlebrush squirreltail-----	5
					winterfat-----	5
Kenzo-----	Semidesert Shallow Loam (Utah Juniper-Pinyon)	650	450	250	Utah juniper-----	35
					broom snakeweed-----	10
					green Mormon tea-----	10
					Fremont's mahonia-----	5
					Indian ricegrass-----	5
					galleta-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					roundleaf buffaloberry-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5174: Strych-----	Semidesert Stony Loam (Utah Juniper-Pinyon)	400	300	200	Indian ricegrass-----	15
					Utah juniper-----	15
					galleta-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					roundleaf buffaloberry-----	10
					Wyoming big sagebrush-----	5
					broom snakeweed-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					twoneedle pinyon-----	5
Sazi, moist-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush-----	20
					miscellaneous shrubs-----	20
					Indian ricegrass-----	15
					galleta-----	15
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					bottlebrush squirreltail-----	5
					winterfat-----	5
Pinepoint-----	Upland Sand (Mountain Big Sagebrush)	800	600	400	mountain big sagebrush-----	20
					blue grama-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					rubber rabbitbrush-----	10
					sand sagebrush-----	10
					Gambel oak-----	5
					Indian ricegrass-----	5
					broom snakeweed-----	5
					green Mormon tea-----	5
					miscellaneous perennial forbs--	5
					sandhill muhly-----	5
Navajo Sandstone Rock outcrop-----	---	---	---	---	---	---
Parkwash-----	Upland Shallow Sand (Pinyon-Utah Juniper)	450	350	250	Utah juniper-----	15
					twoneedle pinyon-----	15
					Indian ricegrass-----	10
					green Mormon tea-----	10
					mountain big sagebrush-----	10
					pointleaf manzanita-----	10
					antelope bitterbrush-----	5
					blue grama-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5181: Parkelei-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	600	mountain big sagebrush-----	30
					Indian ricegrass-----	10
					blue grama-----	10
					Gambel oak-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
Plumasano, moist-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	600	mountain big sagebrush-----	30
					Indian ricegrass-----	10
					blue grama-----	10
					Gambel oak-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
Pinepoint-----	Upland Sand (Mountain Big Sagebrush)	800	600	400	mountain big sagebrush-----	20
					blue grama-----	10
					miscellaneous perennial grasses	10
					miscellaneous shrubs-----	10
					rubber rabbitbrush-----	10
					sand sagebrush-----	10
					Gambel oak-----	5
					Indian ricegrass-----	5
					broom snakeweed-----	5
					green Mormon tea-----	5
					miscellaneous perennial forbs--	5
					sandhill muhly-----	5
5182: Arabrab-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush-----	15
					twoneedle pinyon-----	15
					Utah juniper-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Sandberg Bluegrass-----	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					yellow rabbitbrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5182: Colskel-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
Carmel Formation Rock outcrop-----	---	---	---	---	---	---
5183: Navajo Sandstone Rock outcrop-----	---	---	---	---	---	---
Parkwash-----	Upland Shallow Sand (Pinyon-Utah Juniper)	450	350	250	Utah juniper----- twoneedle pinyon----- Indian ricegrass----- green Mormon tea----- mountain big sagebrush----- pointleaf manzanita----- antelope bitterbrush----- blue grama----- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	15 15 10 10 10 10 5 5 5 5 5 5
Vessilla-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5185: Nomrah-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	600	mountain big sagebrush-----	30
					Indian ricegrass-----	10
					blue grama-----	10
					Gambel oak-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
Upler-----	Upland Stony Loam (Pinyon-Utah Juniper)	750	500	350	Utah juniper-----	15
					Utah serviceberry-----	15
					twoneedle pinyon-----	15
					Gambel oak-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					alderleaf mountain-mahogany---	5
					antelope bitterbrush-----	5
					mountain big sagebrush-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
5186: Bodot, cool-----	Upland Clay Loam (Low Sagebrush)	1,050	750	500	low sagebrush-----	30
					Indian ricegrass-----	15
					western wheatgrass-----	15
					miscellaneous shrubs-----	10
					antelope bitterbrush-----	5
					blue grama-----	5
					bottlebrush squirreltail-----	5
					mountain big sagebrush-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Sili-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	600	mountain big sagebrush-----	30
					Indian ricegrass-----	10
					blue grama-----	10
					Gambel oak-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5187: Zigzag-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
Aridic Ustorthents-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush----- twoneedle pinyon----- Utah juniper----- green Mormon tea----- miscellaneous shrubs----- Indian ricegrass----- Mexican cliffrose----- Sandberg Bluegrass----- galleta----- grassy rockgoldenrod----- miscellaneous perennial forbs-- miscellaneous perennial grasses yellow rabbitbrush-----	15 15 10 10 10 5 5 5 5 5 5 5 5
5188: Frandsen-----	Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)	1,200	950	750	Indian ricegrass----- mountain big sagebrush----- miscellaneous perennial grasses blue grama----- miscellaneous perennial forbs-- bottlebrush squirreltail----- needleandthread----- miscellaneous shrubs----- winterfat-----	25 20 15 10 10 5 5 5 5
5189: Widtsoe-----	Upland Stony Loam (Pinyon-Utah Juniper)	900	500	200	Indian ricegrass----- Sandberg Bluegrass----- antelope bitterbrush----- mountain big sagebrush----- miscellaneous shrubs----- twoneedle pinyon----- James' cryptantha----- Utah juniper----- black sagebrush----- blue grama----- bottlebrush squirreltail----- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses	10 10 10 10 10 10 5 5 5 5 5 5 5



Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5191: Podo-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	500	250	Indian ricegrass-----	15
					black sagebrush-----	15
					twoneedle pinyon-----	15
					antelope bitterbrush-----	10
					mountain big sagebrush-----	10
					miscellaneous shrubs-----	10
					Utah juniper-----	5
					blue grama-----	5
					needleandthread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
5192: Gerst family-----	Semidesert Shallow Clay (Shadscale-Utah Juniper)	300	150	50	Indian ricegrass-----	15
					galleta-----	15
					roundleaf buffaloberry-----	15
					shadscale-----	15
					bottlebrush squirreltail-----	10
					Utah juniper-----	5
					black sagebrush-----	5
					crispleaf buckwheat-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Cannonville-----	Semidesert Shallow Clay (Shadscale-Utah Juniper)	300	150	50	Indian ricegrass-----	15
					galleta-----	15
					roundleaf buffaloberry-----	15
					shadscale-----	15
					bottlebrush squirreltail-----	10
					Utah juniper-----	5
					black sagebrush-----	5
					crispleaf buckwheat-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Straight Cliffs and Dakota Formation Rock outcrop-----	---	---	---	---	---	---
5193: Kaiparowits Formation Badland-----	---	---	---	---	---	---
5195: Henrieville-----	Semidesert Sandy Loam (Wyoming Big Sagebrush)	675	475	275	Indian ricegrass-----	20
					needleandthread-----	20
					Wyoming big sagebrush-----	15
					miscellaneous perennial grasses	15
					fourwing saltbush-----	10
					galleta-----	5
					green Mormon tea-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5198: Bigpack-----	Upland Loam (Mountain Big Sagebrush-Indian Ricegrass)	1,200	950	750	Indian ricegrass-----	25
					mountain big sagebrush-----	20
					miscellaneous perennial grasses	15
					blue grama-----	10
					miscellaneous perennial forbs--	10
					bottlebrush squirreltail-----	5
					needleandthread-----	5
					miscellaneous shrubs-----	5
					winterfat-----	5
5199: Quagmeier-----	Upland Stony Loam (Pinyon-Utah Juniper)	750	500	350	Utah juniper-----	15
					Utah serviceberry-----	15
					twoneedle pinyon-----	15
					Gambel oak-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					alderleaf mountain-mahogany----	5
					antelope bitterbrush-----	5
					mountain big sagebrush-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Parkelei-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	650	mountain big sagebrush-----	30
					Indian ricegrass-----	10
					blue grama-----	10
					Gambel oak-----	5
					antelope bitterbrush-----	5
					bottlebrush squirreltail-----	5
					broom snakeweed-----	5
					muttongrass-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					western wheatgrass-----	5
5200: Sojourn family-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush-----	15
					twoneedle pinyon-----	15
					Utah juniper-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Sandberg Bluegrass-----	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					yellow rabbitbrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5200: Colskel-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush-----	15
					twoneedle pinyon-----	15
					Utah juniper-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Sandberg Bluegrass-----	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					yellow rabbitbrush-----	5
Retsabal-----	Semidesert Shallow Gypsum (Mormon tea)	450	350	250	Indian ricegrass-----	15
					Torrey Mormon tea-----	10
					broom snakeweed-----	10
					Brenda's yellow cryptantha-----	5
					Fremont's mahonia-----	5
					Mexican cliffrose-----	5
					Utah juniper-----	5
					bottlebrush squirreltail-----	5
					crispleaf buckwheat-----	5
					galleta-----	5
					green Mormon tea-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					twoneedle pinyon-----	5
					yellow rabbitbrush-----	5
5201: Sojourn family-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	550	450	black sagebrush-----	15
					twoneedle pinyon-----	15
					Utah juniper-----	10
					green Mormon tea-----	10
					miscellaneous shrubs-----	10
					Indian ricegrass-----	5
					Mexican cliffrose-----	5
					Sandberg Bluegrass-----	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					yellow rabbitbrush-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5201: Aridic Ustorthents-----	Upland Steep Stony Loam (Utah Juniper-Pinyon)	625	425	275	Utah juniper-----	15
					twoneedle pinyon-----	15
					miscellaneous shrubs-----	10
					roundleaf buffaloberry-----	10
					Gambel oak-----	5
					Indian ricegrass-----	5
					Utah serviceberry-----	5
					alderleaf mountain-mahogany----	5
					galleta-----	5
					grassy rockgoldenrod-----	5
					green Mormon tea-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
5203: Wiggler-----	Upland Shallow Loam (Pinyon-Utah Juniper)	650	500	250	Indian ricegrass-----	15
					black sagebrush-----	15
					twoneedle pinyon-----	15
					antelope bitterbrush-----	10
					mountain big sagebrush-----	10
					miscellaneous shrubs-----	10
					Utah juniper-----	5
					blue grama-----	5
					needle and thread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Curecanti family, cool--	---	1,500	1,000	700	ponderosa pine-----	30
					Indian ricegrass-----	10
					greenleaf manzanita-----	10
					miscellaneous perennial grasses	10
					Rocky Mountain juniper-----	5
					antelope bitterbrush-----	5
					black sagebrush-----	5
					blue grama-----	5
					mountain big sagebrush-----	5
					muttongrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
5205: Curecanti family-----	Mountain Stony Loam (Oak)	1,875	1,400	1,000	mountain brome-----	20
					Gambel oak-----	15
					Sandberg Bluegrass-----	15
					antelope bitterbrush-----	15
					muttongrass-----	10
					miscellaneous perennial forbs--	10
					mountain big sagebrush-----	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5205: Curecanti family, cool--	---	1,500	1,000	700	ponderosa pine----- Indian ricegrass----- greenleaf manzanita----- miscellaneous perennial grasses Rocky Mountain juniper----- antelope bitterbrush----- black sagebrush----- blue grama----- mountain big sagebrush----- muttongrass----- miscellaneous perennial forbs-- miscellaneous shrubs-----	30 10 10 10 5 5 5 5 5 5 5 5
Widtsoe-----	Upland Stony Loam (Pinyon-Utah Juniper)	900	500	200	Indian ricegrass----- Sandberg Bluegrass----- antelope bitterbrush----- mountain big sagebrush----- miscellaneous shrubs----- twoneedle pinyon----- James' cryptantha----- Utah juniper----- black sagebrush----- blue grama----- bottlebrush squirreltail----- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses	10 10 10 10 10 10 5 5 5 5 5 5 5
5206: Upler-----	Upland Stony Loam (Pinyon-Utah Juniper)	750	500	350	Utah juniper----- Utah serviceberry----- twoneedle pinyon----- Gambel oak----- miscellaneous shrubs----- Indian ricegrass----- alderleaf mountain-mahogany---- antelope bitterbrush----- mountain big sagebrush----- muttongrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses	15 15 15 10 10 5 5 5 5 5 5 5
5207: Winetti-----	---	1,500	1,000	700	ponderosa pine----- Indian ricegrass----- greenleaf manzanita----- miscellaneous perennial grasses Rocky Mountain juniper----- antelope bitterbrush----- black sagebrush----- blue grama----- mountain big sagebrush----- muttongrass----- miscellaneous perennial forbs-- miscellaneous shrubs-----	30 10 10 10 5 5 5 5 5 5 5 5

Table 5.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
5207: Riverwash-----	---	---	---	---	---	---
5210: Elpedro, moist-----	Upland Loam (Mountain Big Sagebrush)	1,050	900	650	mountain big sagebrush----- Indian ricegrass----- blue grama----- Gambel oak----- antelope bitterbrush----- bottlebrush squirreltail----- broom snakeweed----- muttongrass----- needle and thread----- miscellaneous perennial forbs-- miscellaneous perennial grasses  miscellaneous shrubs----- western wheatgrass-----	30 10 10 5 5 5 5 5 5 5 5 5 5
Flatnose-----	Loamy Bottom (Basin Big Sagebrush)	2,000	1,600	1,000	basin big sagebrush----- basin wildrye----- Indian ricegrass----- miscellaneous perennial grasses  rubber rabbitbrush----- Sandberg Bluegrass----- fourwing saltbush----- muttongrass----- miscellaneous perennial forbs-- miscellaneous shrubs----- western wheatgrass-----	25 15 10 10 10 5 5 5 5 5 5
5211: Yarts, moist-----	Semidesert Sandy Loam (Wyoming Big Sagebrush)	675	475	275	Indian ricegrass----- needle and thread----- Wyoming big sagebrush----- miscellaneous perennial grasses  fourwing saltbush----- galleta----- green Mormon tea----- miscellaneous perennial forbs-- miscellaneous shrubs-----	20 20 15 15 10 5 5 5 5
Sazi, moist-----	Semidesert Loam (Wyoming Big Sagebrush)	875	675	475	Wyoming big sagebrush----- miscellaneous shrubs----- Indian ricegrass----- galleta----- miscellaneous perennial forbs-- miscellaneous perennial grasses  bottlebrush squirreltail----- winterfat-----	20 20 15 15 10 10 5 5







Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
5019: Skos, dry-----	0-2	Very channery loam	GC	A-2	0	35-40	50-60	40-50	35-45	25-35	31-42	12-19
	2-8	Very channery loam	GC	A-6	0	25-35	55-70	50-60	45-55	35-45	30-42	12-19
	8-18	Very channery loam	GC	A-6	0	25-35	55-70	50-60	45-55	35-45	30-41	12-19
	18-28	Bedrock			---	---	---	---	---	---	---	---
Page Sandstone, Carmel Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
Arches, dry-----	0-3	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-22	NP-4
	3-10	Loamy fine sand	SM	A-2	0	0	100	100	65-85	20-40	0-22	NP-4
	10-13	Loamy fine sand	SM	A-2	0	0	100	100	65-85	20-40	0-22	NP-4
	13-23	Bedrock			---	---	---	---	---	---	---	---
5020: Navajo Sandstone Rock outcrop---	0-60	Bedrock			---	---	---	---	---	---	---	---
Mespuun-----	0-5	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-20	NP-2
	5-40	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-18	NP-1
	40-60	Sand	SP-SM	A-2	0	0	100	100	50-70	5-15	0-18	NP-1
Nalcase-----	0-10	Sand	SP-SM	A-3	0	0	100	100	50-70	5-15	0-19	NP-2
	10-13	Sand	SP-SM	A-2	0	0	100	100	50-70	5-15	0-19	NP-2
	13-23	Bedrock			---	---	---	---	---	---	---	---
5021: Milok, cool-----	0-8	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-85	40-55	21-33	4-12
	8-16	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-85	40-55	21-33	4-12
	16-30	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-85	40-55	20-32	4-12
	30-38	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-85	40-55	20-31	4-12
	38-60	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-85	40-55	20-31	4-12
Anasazi, cool---	0-3	Loam	CL-ML	A-4	0	0	95-100	90-100	80-90	60-70	21-33	4-12
	3-10	Loam	CL-ML	A-4	0	0	95-100	90-100	80-90	60-70	21-33	4-12
	10-20	Loam	CL	A-4	0	0	95-100	90-100	80-90	60-70	20-32	4-12
	20-30	Gravelly fine sandy loam	SC-SM	A-2	0	0	65-75	60-70	45-55	30-40	20-31	4-12
	30-40	Bedrock			---	---	---	---	---	---	---	---
5023: Tsaya-----	0-3	Channery loam	CL	A-6	0	10-20	80-85	75-85	65-75	50-60	30-40	12-19
	3-6	Very channery loam	GC	A-2	5-15	35-45	55-65	50-60	40-50	30-40	30-40	12-19
	6-9	Very channery loam	GC	A-2	5-15	35-45	55-65	50-60	40-50	30-40	29-39	12-19
	9-19	Bedrock			---	---	---	---	---	---	---	---
5025: Yarts-----	0-10	Sandy loam	SC	A-2	0	0	100	100	60-70	25-35	20-31	4-12
	10-60	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-60	18-30	4-12



Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5030:												
Catahoula-----	0-5	Very bouldery sandy loam	SC	A-2	25-35	10-20	65-75	60-70	45-55	20-30	21-35	6-13
	5-26	Very bouldery loam	SC	A-6	25-35	10-20	75-85	70-80	60-70	45-55	30-42	12-19
	26-49	Very bouldery loam	CL	A-6	40-50	5-10	90-95	85-95	75-85	55-70	30-42	12-19
	49-60	Very bouldery loam	CL	A-6	40-50	10-20	90-95	85-95	75-85	55-70	30-41	12-19
Clapper, dry----	0-5	Very stony sandy loam	SC	A-2	20-30	20-30	75-85	70-80	50-60	20-30	23-33	7-12
	5-13	Very stony loam	SC	A-6	20-30	20-30	75-85	70-80	60-65	40-50	30-42	12-19
	13-20	Very cobbly loam	GC	A-6	10-20	40-50	60-70	55-65	50-55	35-45	30-41	12-19
	20-38	Very cobbly loam	SC	A-6	5-10	40-50	75-85	70-80	65-70	45-55	30-41	12-19
	38-60	Very cobbly loam	SC	A-6	5-10	40-50	75-85	70-80	65-70	45-55	30-40	12-19
5031:												
Moclom-----	0-3	Gravelly sand	SW-SM	A-1	0	0	70-80	65-75	35-50	5-10	0-21	NP-2
	3-10	Sand	SW-SM	A-1	0	0	85-95	80-95	40-55	5-10	0-21	NP-2
	10-20	Bedrock			---	---	---	---	---	---	---	---
Morrison Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5032:												
Remorris-----	0-3	Silty clay loam	CL	A-7	0	0	85-95	80-90	75-85	65-75	39-49	19-25
	3-10	Silty clay loam	CL	A-7	0	0	95-100	90-95	85-95	75-85	38-49	19-25
	10-15	Silty clay loam	CL	A-7	0	0	95-100	90-95	85-95	75-85	38-48	19-25
	15-25	Weathered bedrock			---	---	---	---	---	---	---	---
Kenzo, steep----	0-3	Gravelly sandy loam	GC	A-2	0	0	55-65	50-60	30-40	15-25	21-33	4-12
	3-8	Gravelly loam	SC	A-6	0	0	70-80	65-75	60-65	40-50	20-32	4-12
	8-18	Bedrock			---	---	---	---	---	---	---	---
Morrison and Entrada Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5033:												
Yarts, eroded---	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-60	21-33	6-12
	4-22	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-60	21-32	6-12
	22-60	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-60	20-30	6-12

Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
						Pct	Pct				Pct	
5034:												
Nonip-----	0-1	Very channery loam	GC	A-2	0	35-40	55-65	50-60	40-50	30-40	30-42	12-19
	1-5	Very channery loam	GC	A-2	0	35-40	55-65	50-60	40-50	30-40	30-42	12-19
	5-15	Bedrock			---	---	---	---	---	---	---	---
5035:												
Earlweed-----	0-4	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-24	NP-6
	4-12	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-24	NP-6
	12-24	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-23	NP-6
	24-40	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-23	NP-6
	40-60	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-23	NP-6
Mido-----	0-1	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-20	NP-2
	1-60	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-20	NP-2
5037:												
Barx-----	0-5	Fine sandy loam, sandy loam	SC	A-4	0	0	100	100	70-85	40-55	21-35	4-12
	5-12	Sandy clay loam, clay loam	SC	A-6	0	0	100	100	80-90	35-55	30-42	12-19
	12-31	Sandy loam, fine sandy loam	SC	A-2	0	0	100	100	60-70	30-40	20-31	4-12
	31-48	Sandy loam, fine sandy loam	SC	A-2	0	0	100	100	60-70	30-40	18-31	4-12
	48-60	Sandy loam, fine sandy loam	SC	A-2	0	0	100	100	60-70	30-40	18-31	4-12
5038:												
Mido-----	0-4	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-20	NP-2
	4-60	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-19	NP-2
Entrada Sandstone Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5040:												
Sazi-----	0-5	Fine sandy loam	SC	A-4	0	0	100	100	65-85	40-55	22-33	6-12
	5-20	Fine sandy loam	SC	A-6	0	0	100	100	65-85	40-55	22-33	6-12
	20-38	Fine sandy loam	SC	A-4	0	0	100	100	65-85	40-55	21-32	6-12
	38-48	Bedrock			---	---	---	---	---	---	---	---
Milok, cool-----	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-85	40-55	21-33	4-12
	4-18	Fine sandy loam	SC	A-4	0	0	100	100	65-85	40-55	21-33	4-12
	18-32	Fine sandy loam	SC	A-4	0	0	100	100	65-85	40-55	20-32	4-12
	32-60	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-85	40-55	20-31	4-12

Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5041: Seeg, warm-----	0-3	Gravelly loamy fine sand	SC-SM	A-2	2-12	10-20	70-80	65-75	50-60	10-20	0-24	NP-6
	3-8	Very gravelly sandy loam	SC-SM	A-2	2-12	2-12	65-75	60-70	35-45	15-25	21-31	6-12
	8-15	Very gravelly sandy loam	GC	A-2	10-20	10-20	45-55	40-50	25-35	10-20	21-31	6-12
	15-35	Very cobbly loamy sand	SC-SM	A-1	10-20	25-35	65-75	60-70	35-45	15-25	17-24	2-6
	35-60	Extremely stony loamy sand	SM	A-1	25-35	25-35	60-70	55-65	35-45	10-20	16-24	2-6
Pagina-----	0-4	Loamy fine sand	SC-SM	A-2	0	0	86-96	80-90	55-65	15-25	20-31	4-12
	4-17	Sandy loam	SC-SM	A-2	0	0	95-100	90-100	60-70	30-40	20-31	4-12
	17-25	Sandy loam	SC-SM	A-2	0	0	82-90	75-85	45-55	25-35	19-30	4-12
	25-31	Gravelly loamy sand	SC-SM	A-1	0	0	76-86	70-80	45-55	15-25	19-30	4-12
	31-41	Weathered bedrock			---	---	---	---	---	---	---	---
5042: Moenkopie, warm-	0-6	Loamy fine sand	SM	A-2	0	0	90-100	85-95	50-60	20-30	0-22	NP-4
	6-12	Loamy sand	SM	A-2	0	5-15	95-100	90-100	60-70	15-25	0-22	NP-4
	12-22	Bedrock			---	---	---	---	---	---	---	---
Moepitz-----	0-3	Loamy fine sand	SM	A-2	0	0	100	100	55-65	15-25	0-22	NP-4
	3-8	Loamy fine sand	SM	A-2	0	0	100	100	55-65	15-25	0-22	NP-4
	8-28	Sandy loam	SC-SM	A-2	0	0	100	100	60-70	30-40	19-31	4-12
	28-38	Bedrock			---	---	---	---	---	---	---	---
Carmel Formation Rock outcrop---	0-60	Bedrock			---	---	---	---	---	---	---	---
5043: Daklos, steep---	0-3	Very cobbly fine sandy loam	SC-SM	A-2	20-30	25-35	75-85	70-80	45-55	25-35	24-33	7-12
	3-13	Very stony loam	GC	A-4	25-35	20-30	65-75	60-70	50-60	40-50	23-33	7-12
	13-23	Bedrock			---	---	---	---	---	---	---	---
Morrison Formation and Romano Mesa Sandstone Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5044: Dient-----	0-4	Very stony loam	GC	A-6	20-30	10-20	65-75	60-70	60-65	40-50	30-40	12-19
	4-12	Very stony loam	GC	A-6	25-35	10-20	55-65	50-60	45-55	35-45	30-40	12-19
	12-60	Very stony loam	SC	A-6	35-45	20-30	70-80	65-75	60-65	40-50	29-40	12-19







Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5061: Navajo Sandstone Rock outcrop----	0-60	Bedrock			---	---	---	---	---	---	---	---
Suzipon-----	0-8	Loamy fine sand	SM	A-2	0	0-5	85-95	80-90	65-75	25-35	0-21	NP-3
	8-18	Bedrock			---	---	---	---	---	---	---	---
Peekaboo-----	0-3	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-20	NP-2
	3-22	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-19	NP-2
	22-32	Bedrock			---	---	---	---	---	---	---	---
5062: Peekaboo-----	0-4	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-20	NP-2
	4-12	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-20	NP-2
	12-29	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-19	NP-2
	29-39	Bedrock			---	---	---	---	---	---	---	---
Spooky-----	0-4	Loamy fine sand	SM	A-2	0	0	95-100	90-100	65-75	25-35	0-20	NP-2
	4-14	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-20	NP-2
	14-38	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-20	NP-2
	38-46	Loamy fine sand	SM	A-2	0	0	95-100	90-100	65-75	25-35	0-19	NP-2
	46-56	Bedrock			---	---	---	---	---	---	---	---
Suzipon-----	0-4	Loamy fine sand	SM	A-2	0	0	95-100	90-100	65-75	25-35	0-20	NP-2
	4-19	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-20	NP-2
	19-29	Bedrock			---	---	---	---	---	---	---	---
5063: Navajo Sandstone and Carmel Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
Moenkopie, warm-	0-6	Loam	CL-ML	A-4	0	0	95-100	95-100	80-90	55-65	20-31	4-12
	6-13	Gravelly loam	CL	A-4	0	5-10	80-90	75-85	65-75	50-60	19-31	4-12
	13-16	Weathered bedrock			---	---	---	---	---	---	---	---
	16-26	Bedrock			---	---	---	---	---	---	---	---
Needle-----	0-5	Loamy fine sand	SM	A-2	0	0	95-100	90-100	65-75	25-35	0-20	NP-2
	5-13	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-19	NP-2
	13-23	Bedrock			---	---	---	---	---	---	---	---
5065: Trail-----	0-12	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-22	NP-2
	12-29	Loamy sand	SM	A-2	0	0	100	100	50-75	15-30	0-22	NP-2
	29-46	Loamy sand	SM	A-2	0	0	100	100	50-75	15-30	0-22	NP-2
	46-60	Sand	SP-SM	A-3	0	0	100	100	50-70	5-15	0-21	NP-2
Sheppard-----	0-6	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-22	NP-4
	6-32	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-21	NP-3
	32-60	Loamy fine sand	SM	A-4	0	0	100	100	70-85	30-45	0-20	NP-3









Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5083:												
Colskel-----	0-2	Very gravelly sandy loam	GC	A-2	3-13	10-20	55-65	50-60	30-40	15-25	22-35	4-12
	2-8	Very gravelly loam	GC	A-2	10-20	23-33	50-65	45-55	40-50	30-40	30-41	12-19
	8-18	Bedrock			---	---	---	---	---	---	---	---
Menefee-----	0-3	Gravelly loam	CL	A-6	0	10-20	82-92	78-88	65-75	50-60	32-45	12-19
	3-8	Loam	CL	A-6	0	0	100	100	85-95	60-75	30-41	12-19
	8-18	Weathered bedrock			---	---	---	---	---	---	---	---
5085:												
Hillburn-----	0-2	Very channery loam	GC	A-6	0-10	35-45	65-75	60-70	45-55	35-45	31-42	12-19
	2-7	Very flaggy loam	SC	A-6	3-13	40-50	75-85	70-80	60-70	45-55	30-41	12-19
	7-13	Very channery loam	GC	A-6	0-10	35-45	65-75	60-70	45-55	35-45	30-41	12-19
	13-23	Bedrock			---	---	---	---	---	---	---	---
5086:												
Mespin-----	0-4	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-19	NP-1
	4-41	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-18	NP-1
	41-60	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-18	NP-1
Bispen-----	0-4	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-20	NP-2
	4-52	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-19	NP-2
	52-62	Bedrock			---	---	---	---	---	---	---	---
Santrick-----	0-3	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-20	NP-2
	3-24	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-19	NP-2
	24-34	Bedrock			---	---	---	---	---	---	---	---
5087:												
Kenzo, steep---	0-4	Cobbly loamy sand	SC-SM	A-1	0	10-20	72-82	68-78	35-50	10-20	21-33	4-12
	4-11	Cobbly sandy loam	SC-SM	A-2	3-13	20-30	90-100	85-95	55-65	25-35	19-31	4-12
	11-21	Bedrock			---	---	---	---	---	---	---	---
Kayenta Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5088:												
Calcree-----	0-8	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-25	NP-4
	8-15	Fine sand	SM	A-2	0	0	95-100	90-100	65-75	20-35	0-24	NP-4
	15-27	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-24	NP-4
	27-37	Bedrock			---	---	---	---	---	---	---	---
Bowington-----	0-16	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-25	NP-4
	16-46	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-24	NP-4
	46-60	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-24	NP-4

















Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5118:												
Mido-----	0-29	Loamy fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-20	NP-2
	29-60	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-19	NP-2
Kenzo-----	0-2	Very gravelly loam	SC-SM	A-1	0	10-20	72-82	68-78	35-50	10-20	21-33	4-12
	2-11	Gravelly loam	SC-SM	A-2	3-13	20-30	90-100	85-95	55-65	25-35	19-31	4-12
	11-21	Bedrock			---	---	---	---	---	---	---	---
Carmel Formation Rock outcrop---	0-60	Bedrock			---	---	---	---	---	---	---	---
5120:												
Pinepoint-----	0-19	Loamy fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-24	NP-2
	19-38	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-22	NP-2
	38-60	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-20	NP-2
Flatnose-----	0-13	Fine sand	SC-SM	A-2	0	0	100	100	65-80	20-35	22-35	4-12
	13-16	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	21-35	4-12
	16-31	Loam	CL	A-6	0	0	100	100	85-95	60-75	23-39	4-14
	31-41	Loamy sand	SC-SM	A-2	0	0	100	100	50-75	15-30	21-33	4-12
	41-52	Sand	SP-SM	A-2	0	0	100	100	50-70	5-15	0-27	NP-4
	52-60	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	23-37	4-12
5121:												
Trail-----	0-11	Loamy fine sand	SM	A-4	0	0	100	100	75-90	30-50	0-20	NP-2
	11-29	Loamy fine sand	SM	A-4	0	0	100	100	75-90	30-50	0-20	NP-2
	29-60	Loamy sand	SM	A-2	0	0	100	100	65-80	20-35	0-20	NP-2
Riverwash-----	---	---	---	---	---	---	---	---	---	---	---	---
5122:												
Mido-----	0-4	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-20	NP-2
	4-16	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-19	NP-2
	16-60	Fine sand	SM	A-2	0	0	100	100	65-80	10-20	0-19	NP-2
Mivida-----	0-5	Loamy fine sand	SC-SM	A-2	0	0	100	100	70-80	25-35	21-33	4-12
	5-23	Sandy loam	SC	A-2	0	0	100	100	60-70	30-40	20-33	4-12
	23-38	Fine sandy loam	SC	A-4	0	0	80-90	75-85	55-65	30-45	20-31	4-12
	38-60	Gravelly loam	SC	A-6	0	0	70-80	60-70	50-60	40-50	18-29	4-12
5123:												
Billings-----	0-4	Clay loam	CL	A-7	0	0-5	95-100	90-100	85-95	70-80	38-48	19-25
	4-27	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	37-47	19-25
	27-31	Clay loam	CL	A-7	0	10-20	95-100	90-100	85-95	65-75	37-47	19-25
	31-43	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	37-47	19-25
	43-64	Silty clay loam	CL	A-7	0	2-10	95-100	90-100	90-100	80-90	38-50	19-26
Jocity, saline--	0-4	Fine sandy loam	SC	A-4	0-5	0-5	90-100	85-95	65-75	35-50	26-40	9-19
	4-20	Loam	CL	A-6	0	0	90-100	85-95	75-85	55-70	29-38	12-19
	20-33	Gravelly sandy loam	GC	A-2	0	0-5	50-60	40-50	30-40	10-20	24-36	9-19
	33-37	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	30-40	12-19
	37-46	Loam	CL	A-6	0	0	95-100	90-100	85-95	55-70	29-38	12-19
	46-73	Fine sandy loam	SC	A-6	0	0	90-100	85-95	65-75	35-50	29-38	12-19
	73-79	Fine sandy loam	SC	A-2	0	0-5	85-95	80-90	55-65	30-40	24-36	9-19



Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5129:												
Skyvillage-----	0-1	Sandy loam	SM	A-2	0	0	100	100	60-70	30-40	17-33	2-13
	1-6	Sandy loam	SC-SM	A-2	0	0	100	100	60-70	30-40	17-33	2-13
	6-9	Sandy clay loam	SC	A-6	0	0	95-100	90-100	80-90	45-55	22-38	6-19
	9-19	Bedrock			---	---	---	---	---	---	---	---
Wahweap Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5130:												
Progresso-----	0-2	Sandy loam	SC	A-2	0	0	100	100	60-70	30-40	21-33	4-12
	2-12	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	30-40	12-19
	12-16	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	38-47	19-25
	16-22	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-39	12-19
	22-32	Bedrock			---	---	---	---	---	---	---	---
Begay, dry-----	0-2	Loamy fine sand	SM	A-2	0	0	95-100	90-100	80-90	30-40	0-31	NP-10
	2-8	Loamy fine sand	SM	A-2	0	0	95-100	90-100	80-90	30-40	0-31	NP-10
	8-33	Fine sandy loam	SC-SM	A-4	0	0	95-100	90-100	70-85	40-55	20-32	4-12
	33-57	Fine sandy loam	SC-SM	A-4	0	0	95-100	90-100	70-85	40-55	19-30	4-12
	57-60	Gravelly loam	GC	A-2	0	0	40-50	35-45	30-40	25-35	19-30	4-12
5131:												
Kaiparowits Formation Badland-----	0-1	Loamy fine sand			0	0	---	---	---	---	---	---
	1-60	Weathered bedrock			---	---	---	---	---	---	---	---
Lazear, steep---	0-2	Very cobbly loam	SC	A-6	2-12	20-30	72-80	65-75	60-70	40-50	31-49	12-25
	2-6	Parachannery loam	CL	A-6	0	35-45	95-100	90-100	80-90	65-75	29-45	12-25
	6-10	Weathered bedrock			---	---	---	---	---	---	---	---
	10-20	Bedrock			---	---	---	---	---	---	---	---
5132:												
Strych-----	0-2	Gravelly fine sandy loam	GC	A-2	0	0-10	55-65	50-60	35-45	25-35	21-33	4-12
	2-4	Gravelly fine sandy loam	GC	A-2	0	0-10	70-80	65-75	50-60	30-40	20-32	4-12
	4-7	Very gravelly fine sandy loam	GC	A-2	0-5	0-15	50-60	45-55	35-45	20-30	19-30	4-12
	7-35	Very cobbly sandy loam	GC-GM	A-2	0-5	10-20	40-50	35-45	25-35	10-15	19-30	4-12
	35-56	Gravelly loam	GC	A-6	0	0-10	70-80	65-75	60-70	40-50	21-40	4-19
	56-65	Channery fine sandy loam	SC	A-6	0	45-55	95-100	90-100	70-80	40-55	19-32	4-13



Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5137:												
Casmos family---	0-3	Gravelly loam	CL	A-6	5-15	10-20	80-90	75-85	65-75	50-60	32-39	13-17
	3-10	Gravelly loam	SC	A-6	0	0-5	75-85	70-80	60-70	45-55	31-38	13-18
	10-13	Channery loam	SC	A-6	0	45-55	70-80	65-75	55-65	40-50	31-38	13-18
	13-23	Bedrock			---	---	---	---	---	---	---	---
Pariette family-	0-3	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	20-31	4-12
	3-9	Loam	CL	A-6	0	0	100	100	85-95	60-75	30-40	12-19
	9-15	Loam	CL	A-6	0	0	95-100	90-100	80-90	55-65	29-40	12-19
	15-29	Loam	SC	A-6	0	0	85-95	80-90	70-80	45-55	29-40	12-19
	29-38	Very gravelly loam	GC	A-2	0	5-15	40-50	35-45	30-40	25-35	29-40	12-19
	38-48	Weathered bedrock			---	---	---	---	---	---	---	---
Dakota and Morrison Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5138:												
Nakai-----	0-3	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-31	NP-12
	3-21	Loamy fine sand	SM	A-2	0	0	100	100	70-80	30-40	0-31	NP-12
	21-31	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	20-32	4-12
	31-63	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	20-32	4-12
	63-79	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-31	NP-12
Sheppard-----	0-3	Fine sand	SM	A-2	0	0	100	100	65-80	20-30	0-24	NP-6
	3-44	Loamy fine sand	SM	A-2	0	0	100	100	70-80	25-35	0-24	NP-6
	44-61	Loamy fine sand	SM	A-2	0	0	100	100	70-80	25-35	0-23	NP-6
	61-79	Loamy fine sand	SC-SM	A-2	0	0	100	100	70-80	25-35	0-23	NP-6
5139:												
Hetz-----	0-1	Slightly decomposed plant material			---	---	---	---	---	---	---	---
	1-8	Moderately decomposed plant material			---	---	---	---	---	---	---	---
	8-13	Sandy loam	SC	A-2	0	0	100	100	60-70	30-40	28-37	9-13
	13-17	Sandy loam	SC	A-2	0	0	100	100	60-70	30-40	29-41	12-19
	17-26	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	37-45	19-25
	26-52	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	37-45	19-25
	52-71	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	37-45	19-25
5140:												
Green River-----	0-7	Fine sandy loam	SC	A-4	0	0	95-100	90-100	65-80	35-50	21-33	4-12
	7-14	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	18-29	4-12
	14-29	Loamy fine sand	SM	A-2	0	0	95-100	90-100	65-80	25-40	16-29	2-12
	29-37	Loamy fine sand	SM	A-4	0	0	100	100	80-90	30-45	16-29	2-12
	37-41	Fine sandy loam	SC	A-6	0	0	100	100	70-85	40-55	21-33	4-12
	41-48	Loamy fine sand	SM	A-2	0	0	95-100	90-100	65-80	25-40	16-29	2-12
	48-63	Gravelly loamy fine sand	SM	A-2	0	0-10	70-80	60-70	40-55	20-35	16-29	2-12

Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
				Pct	Pct					Pct		
5140:												
Radnik, moist---	0-3	Loam	CL	A-6	0	0	100	100	85-95	60-75	31-42	12-19
	3-9	Fine sandy loam	SC	A-6	0	0	100	100	70-85	40-55	18-29	4-12
	9-19	Fine sandy loam	SC-SM	A-4	0	0	100	85-95	65-75	35-50	18-29	4-12
	19-30	Loamy fine sand	SM	A-2	0	0	100	90-100	70-80	25-40	0-20	NP-4
	30-36	Loam	CL	A-4	0	0	100	100	85-95	60-75	18-29	4-12
	36-44	Very fine sandy loam	ML	A-4	0	0	100	90-100	80-90	50-60	0-20	NP-4
	44-50	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	18-29	4-12
	50-59	Loamy fine sand	SM	A-2	0	0	100	100	80-90	25-45	0-20	NP-4
	59-79	Stratified fine sandy loam to loam	CL	A-6	0	0	100	100	85-95	60-75	29-38	12-19
Suwanee, saline-	0-2	Loam	CL	A-6	0	0	100	100	85-95	60-75	22-42	4-19
	2-9	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	18-30	3-13
	9-11	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	31-45	13-25
	11-22	Fine sandy loam	SC	A-4	0	0	95-100	90-100	65-80	35-50	18-30	3-13
	22-28	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	32-47	13-25
	28-38	Loam	CL	A-6	0	0	95-100	90-100	80-90	60-75	29-38	12-19
	38-50	Very fine sandy loam	CL	A-6	0	0	95-100	90-100	65-80	35-50	19-32	4-14
	50-54	Loam	CL	A-6	0	10-20	95-100	95-100	90-100	70-80	29-38	12-19
	54-63	Fine sandy loam	SC-SM	A-4	0	0	95-100	90-100	65-80	35-50	18-30	3-13
5141:												
Radnik, moist---	0-2	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	21-35	4-12
	2-5	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	21-35	4-12
	5-8	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	20-35	4-12
	8-11	Very fine sandy loam	CL	A-4	0	0	100	100	85-95	50-65	20-33	4-12
	11-19	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-24	NP-4
	19-45	Stratified fine sandy loam to loam	CL	A-4	0	0	100	100	70-95	40-75	20-33	4-12
	45-60	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-22	NP-4
Escavada-----	0-16	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-26	NP-6
	16-29	Loamy sand	SM	A-2	0	0	100	100	50-75	15-30	0-25	NP-6
	29-37	Loamy sand	SM	A-2	0	0	100	100	50-75	15-30	0-25	NP-6
	37-60	Extremely cobbly coarse sand	SP	A-1	20-30	50-60	100	10-20	5-15	0-5	0-26	NP-6
Suwanee, saline-	0-8	Loam	CL	A-6	0	0	100	100	80-90	55-65	22-42	4-19
	8-16	Loam	CL	A-6	0	0	100	100	85-95	60-75	30-40	12-19
	16-37	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-40	12-19
	37-39	Loam	CL	A-6	0	0	95-100	90-100	80-90	60-70	28-38	12-19
	39-45	Very fine sandy loam	CL	A-4	0	0	100	100	75-85	55-65	18-32	3-13
	45-48	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-40	12-19
	48-57	Fine sandy loam	SC-SM	A-4	0	0	100	100	60-70	40-55	18-32	3-13
	57-79	Loamy fine sand	SM	A-4	0	0	95-100	90-100	80-90	40-50	0-28	NP-10

Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5142:												
Alvey-----	0-2	Very fine sandy loam	SC	A-2	0	0	100	100	60-70	30-40	29-47	12-24
	2-11	Sandy clay loam	SC	A-6	0	0	100	100	80-90	40-50	30-48	12-25
	11-35	Clay loam	CL	A-7	0	0	100	100	90-100	70-80	29-47	12-25
	35-50	Clay loam	CL	A-7	0	0	100	100	90-100	70-80	29-47	12-25
	50-60	Clay loam	CL	A-7	0	0	100	100	90-100	70-80	29-47	12-25
Atrac-----	0-19	Very fine sandy loam	CL	A-4	0	0	100	100	85-95	50-65	22-41	6-19
	19-29	Loam	CL	A-6	0	0	100	100	85-95	60-75	30-41	12-19
	29-60	Very fine sandy loam	CL	A-4	0	0	100	100	85-95	50-65	21-38	6-19
5143:												
Elias-----	0-2	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	21-33	4-12
	2-6	Clay loam	CL	A-7	0	0	100	100	90-100	70-80	39-49	19-25
	6-11	Loam	CL	A-6	0	0	100	100	85-95	60-75	30-41	12-19
	11-13	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	20-32	4-12
	13-32	Very fine sandy loam	CL	A-4	0	0	100	100	85-95	50-65	20-31	4-12
	32-34	Stratified fine sandy loam to loam	CL	A-6	0	0	100	100	80-90	50-60	30-40	12-19
	34-63	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	19-30	4-12
Mikim-----	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	21-33	4-12
	4-7	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	20-31	4-12
	7-15	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-40	12-19
	15-25	Very fine sandy loam	CL	A-6	0	0	100	100	80-95	50-65	19-30	4-12
	25-28	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-40	12-19
	28-33	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	19-30	4-12
	33-42	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-40	12-19
	42-63	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	19-30	4-12
5144:												
Tsaya-----	0-2	Extremely channery loam	CL	A-6	0	10-20	90-100	85-95	75-85	55-70	30-40	12-19
	2-8	Very channery loam	SC	A-6	0	40-50	75-85	70-80	60-70	45-55	29-40	12-19
	8-13	Extremely channery loam	GC	A-6	5-15	65-75	65-75	60-70	50-60	40-50	29-40	12-19
	13-23	Bedrock			---	---	---	---	---	---	---	---
Straight Cliffs Formation Burnt Sandstone Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5146:												
Moffat-----	0-4	Loamy fine sand	SC-SM	A-4, A-2-4	0	0	100	100	75-85	30-45	20-31	4-12
	4-13	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	20-31	4-12
	13-36	Sandy loam	SC	A-2	0	0	90-100	85-95	55-65	25-35	21-34	4-14
	36-60	Sandy loam	SC	A-2	0	0	85-95	80-90	45-55	25-35	21-33	4-14

Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5146:												
Pagina-----	0-6	Loamy fine sand	SC-SM	A-4, A-2-4	0	0	100	100	75-85	30-45	20-31	4-12
	6-17	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	20-31	4-12
	17-35	Fine sandy loam	SC-SM	A-4	0	0	100	100	70-85	40-55	19-30	4-12
	35-45	Weathered bedrock			---	---	---	---	---	---	---	---
Sheppard-----	0-1	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-22	NP-4
	1-60	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-22	NP-4
5149:												
Tsaya, saline---	0-1	Very bouldery loam	SC	A-6	40-50	10-20	70-80	65-75	55-65	40-50	30-40	12-19
	1-2	Very channery loam	SC	A-6	20-30	30-40	70-80	65-75	55-65	40-50	29-40	12-19
	2-6	Very cobbly loam	GC	A-6	30-40	20-30	60-70	55-65	50-60	35-45	29-40	12-19
	6-16	Bedrock			---	---	---	---	---	---	---	---
Straight Cliffs Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
Lithic												
Torriorhents--	0-1	Sandy loam	SC	A-2	0-10	0-10	100	90-100	55-65	25-35	30-40	12-19
	1-9	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	37-47	19-25
	9-14	Weathered bedrock			---	---	---	---	---	---	---	---
	14-24	Bedrock			---	---	---	---	---	---	---	---
5150:												
Chipeta-----	0-3	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	40-56	21-32
	3-11	Silty clay loam	CH	A-7	0	0	100	100	95-100	85-95	40-55	21-32
	11-21	Weathered bedrock			---	---	---	---	---	---	---	---
Hanksville-----	0-3	Silty clay loam	CL	A-7	0	0	90-100	85-95	85-95	75-85	38-47	19-25
	3-17	Silty clay loam	CL	A-7	0	0	100	100	90-100	90-100	45-64	25-40
	17-31	Silty clay loam	CL	A-7	0	0	95-100	90-100	90-100	90-100	45-64	25-40
	31-38	Parachannery silty clay loam	CL	A-7	0	20-30	90-100	85-95	85-95	75-85	45-64	25-40
	38-48	Weathered bedrock			---	---	---	---	---	---	---	---
Tropic Formation												
Shale Badland--	0-1	Weathered bedrock			---	---	---	---	---	---	---	---
	1-60	Weathered bedrock			---	---	---	---	---	---	---	---
5151:												
Pinepoint, dry--	0-8	Loamy fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-24	NP-2
	8-28	Loamy fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-24	NP-2
	28-54	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-22	NP-2
	54-60	Fine sand	SM	A-2	0	0	100	100	65-80	20-35	0-20	NP-2









Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
				Pct	Pct					Pct		
5170:	In											
Humbag, moist---	0-3	Very fine sandy loam	CL	A-6	0	0	100	100	85-95	50-65	18-33	2-12
	3-5	Very fine sandy loam	CL	A-6	0	0	100	100	85-95	50-65	20-37	2-14
	5-15	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	17-32	2-12
	15-17	Fine sandy loam	SC	A-6	0	0	95-100	90-100	65-75	35-45	17-32	2-12
	17-22	Fine sandy loam	SC	A-2	0	5-15	85-95	80-90	60-70	30-40	16-30	2-12
	22-44	Parachannery fine sandy loam	SC	A-4	0	10-20	80-90	75-85	55-65	30-45	16-30	2-12
	44-49	Very channery fine sandy loam	SC	A-2	0	25-35	70-80	65-75	50-60	30-40	16-30	2-12
	49-59	Weathered bedrock			---	---	---	---	---	---	---	---
5171:												
Kenzo-----	0-4	Channery loam	CL	A-6	0	10-20	90-100	85-95	75-85	55-65	31-42	12-19
	4-13	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-40	12-19
	13-23	Bedrock			---	---	---	---	---	---	---	---
Retsabal-----	0-1	Loam	CL	A-6	0	0	100	100	85-95	60-75	20-32	4-12
	1-11	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-40	12-19
	11-21	Weathered bedrock			---	---	---	---	---	---	---	---
Progresso, cool-	0-6	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-41	12-19
	6-13	Loam	CL	A-6	0	0	100	100	85-95	60-75	30-40	12-19
	13-22	Loam	CL	A-6	0	0	95-100	90-100	85-95	60-75	30-40	12-19
	22-29	Gravelly sandy loam	SC	A-2	0	0	75-85	70-80	45-55	20-30	18-29	4-12
	29-39	Bedrock			---	---	---	---	---	---	---	---
5172:												
Ruinpoint-----	0-2	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	31-42	12-19
	2-10	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	30-41	12-19
	10-25	Silt loam	CL	A-6	0	0	100	100	85-95	70-90	29-40	12-19
	25-60	Silt loam	CL	A-6	0	0	95-100	90-100	85-95	70-90	29-40	12-19
Barx-----	0-2	Fine sandy loam	SC	A-6	0	0	100	100	70-85	35-45	31-42	12-19
	2-8	Sandy clay loam	SC	A-6	0	0	100	100	80-90	40-55	30-42	12-19
	8-17	Clay loam	SC	A-7	0	0	100	100	80-90	40-55	38-48	19-25
	17-30	Fine sandy loam	SC	A-2	0	0	100	100	65-75	30-40	28-39	12-19
	30-42	Loam	SC	A-2	0	0	100	100	60-75	30-40	29-40	12-19
	42-61	Fine sandy loam	SC	A-2	0	0	100	100	60-75	30-40	28-38	12-19









Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5192:												
Gerst family----	0-3	Loam	CL	A-6	0	0	100	100	85-95	60-75	30-40	12-19
	3-12	Loam	CL	A-6	0	0	100	100	85-95	60-75	29-40	12-19
	12-22	Weathered bedrock			---	---	---	---	---	---	---	---
Cannonville-----	0-7	Clay	CH	A-7	0	0	95-100	95-100	85-100	70-90	49-61	29-37
	7-17	Weathered bedrock			---	---	---	---	---	---	---	---
Straight Cliffs and Dakota Formation Rock outcrop-----	0-60	Bedrock			---	---	---	---	---	---	---	---
5193:												
Kaiparowits Formation Badland-----	0-1	Loamy fine sand			0	0	---	---	---	---	---	---
	1-60	Weathered bedrock			---	---	---	---	---	---	---	---
5195:												
Henrieville-----	0-5	Sandy loam	SC-SM	A-2	0	0	100	100	60-70	30-40	22-35	4-12
	5-13	Sandy loam	SC	A-2	0	0	100	100	60-70	30-40	21-33	4-12
	13-24	Sandy loam	SC	A-2	0	0	100	100	60-70	30-40	21-33	4-12
	24-41	Loamy sand	SC-SM	A-2	0	0	100	100	50-75	15-30	20-32	4-12
	41-61	Loamy sand	SC-SM	A-2	0	0	100	100	50-75	15-30	20-32	4-12
	61-69	Gravelly loamy sand	SC-SM	A-1	0	0	72-80	65-75	35-60	10-25	17-31	2-12
	>69	Sand	SP-SM	A-2	0	0	100	100	50-70	5-15	15-30	1-12
5198:												
Bigpack-----	0-2	Clay loam	CL	A-7	0	0	90-100	90-100	85-95	65-75	39-49	19-25
	2-12	Loam	CL	A-6	0	0	90-100	90-100	80-90	60-70	30-41	12-19
	12-28	Loam	CL	A-6	0	0	90-100	90-100	80-90	60-70	29-40	12-19
	28-60	Loam	CL	A-6	0	0	80-90	75-85	65-75	50-60	29-40	12-19
5199:												
Quagmeier-----	0-6	Extremely stony sandy loam	SC	A-2	20-30	10-20	66-76	60-70	35-45	20-30	22-35	4-12
	6-12	Very stony clay loam	GC	A-7	20-30	10-20	66-76	60-70	60-70	45-55	39-49	19-25
	12-23	Extremely stony loam	GC	A-6	25-35	20-30	66-76	60-70	55-65	40-50	30-41	12-19
	23-30	Extremely stony loam	GC	A-6	40-50	20-30	62-71	55-65	50-60	35-45	30-41	12-19
	30-60	Extremely stony loam	SC	A-2	45-55	20-30	62-71	55-65	30-40	10-20	30-41	12-19
Parkelei-----	0-7	Sandy loam	SC	A-2	0	0	100	100	60-70	30-40	23-43	6-18
	7-19	Loam	CL	A-6	0	0	100	100	85-95	60-75	33-42	13-19
	19-36	Loam	CL	A-6	0	0	100	100	85-95	60-75	32-48	13-25
	36-60	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-55	32-48	13-25



Table 6.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5205: Curecanti family	0-1	Moderately decomposed plant material			---	---	---	---	---	---	---	---
	1-7	Very stony loam	SC	A-6	20-30	10-20	77-87	70-80	60-70	45-55	32-51	12-25
	7-17	Very stony clay loam	CL	A-7	20-30	10-20	77-87	70-80	60-70	50-60	32-51	12-25
	17-60	Very stony clay loam	CL	A-7	25-35	10-20	77-87	70-80	60-70	50-60	31-49	12-25
Curecanti family, cool---	0-8	Very stony loam	SC	A-6	20-30	10-20	79-89	70-80	60-70	45-55	32-51	12-25
	8-19	Very stony clay loam	CL	A-7	25-35	10-20	79-89	70-80	65-75	50-60	32-51	12-25
	19-60	Very stony clay loam	CL	A-7	20-30	20-30	79-89	70-80	65-75	50-60	33-51	12-25
Widtsoe-----	0-7	Very gravelly loam	GC	A-6	10-20	10-20	62-72	55-65	55-65	40-50	32-45	12-20
	7-12	Very stony clay loam	CL	A-7	10-20	10-20	72-82	65-75	60-70	50-60	38-51	19-26
	12-23	Very stony clay loam	GC	A-7	10-30	10-20	68-78	60-70	55-65	45-55	44-53	23-27
	23-63	Very stony clay loam	SC	A-7	10-30	10-20	68-78	60-70	50-60	40-50	35-43	17-21
5206: Upler-----	0-8	Cobbly loam	SC	A-6	10-20	25-35	75-85	70-80	60-70	45-55	26-39	8-15
	8-15	Stony loam	CL	A-6	10-20	10-20	80-90	75-85	65-75	50-60	30-42	11-19
	15-26	Stony loam	CL	A-6	10-20	20-30	90-99	85-95	75-85	55-65	32-44	13-21
	26-60	Very stony loam	CL	A-6	20-30	25-35	90-99	85-95	75-85	55-65	33-45	15-23
5207: Winetti-----	0-6	Gravelly loam	CL	A-6	0	5-15	82-92	77-87	70-80	55-65	30-44	9-17
	6-17	Gravelly loam	CL	A-6	0	5-15	82-92	77-87	70-80	55-65	29-42	11-19
	17-60	Very cobbly sandy loam	SC-SM	A-1	0	35-45	71-81	68-75	40-50	20-30	18-28	3-10
Riverwash-----	---	---	---	---	---	---	---	---	---	---	---	---
5210: Elpedro, moist--	0-3	Silt loam	CL-ML	A-4	0	0	100	100	90-100	70-90	22-35	4-12
	3-9	Silt loam	CL-ML	A-4	0	0	100	100	90-100	70-90	22-35	4-12
	9-20	Silt loam	CL-ML	A-4	0	0	100	100	90-100	70-90	21-33	4-12
	20-46	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	30-41	12-19
	46-63	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	39-49	19-25
Flatnose-----	0-3	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	22-35	4-12
	3-8	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	21-35	4-12
	8-15	Fine sandy loam	SC	A-4	0	0	100	100	70-85	40-55	22-35	4-12
	15-19	Sandy loam	SC-SM	A-2	0	0	100	100	60-70	30-40	21-33	4-12
	19-35	Very fine sandy loam	SC	A-4	0	0	100	100	75-90	35-55	24-35	4-12
	35-60	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	39-51	19-25



Table 7.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR
								In	Pct	In/hr	In/in	Pct	Pct	
5001: Mido-----	0-3	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134	7s	---
	3-46	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.5	.15	.15					
	46-60	1-5	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-0.5	.15	.15					
5002: Dune land-----	0-60	0-3	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-0.0	.15	.15	--	1	310	8	---
5003: Milok, cool-----	0-2	6-18	1.35-1.45	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.28	.28	5	3	86	6e	---
	2-8	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24					
	8-23	8-18	1.25-1.40	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24					
	23-38	8-18	1.25-1.40	2-6	0.10-0.12	0.0-2.9	0.5-2.0	.20	.20					
	38-60	8-18	1.25-1.40	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.20					
Barx, dry-----	0-2	6-8	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86	6e	---
	2-9	8-18	1.25-1.40	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.20	.20					
	9-19	8-18	1.25-1.40	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.20	.20					
	19-32	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-2.0	.28	.28					
	32-56	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.28	.28					
	56-72	8-18	1.25-1.40	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.20					
5004: Navajo Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	--	8	0	8	---
5006: Milok, cool-----	0-8	8-18	1.35-1.45	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.28	.28	5	3	86	6e	---
	8-18	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24					
	18-27	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24					
	27-60	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24					
5007: Navajo Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	--	8	0	8	---

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5007:															
Nalcase-----	0-4	0-5	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.2-0.8	.15	.15	1	1	250	7s	---	
	4-8	0-5	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.2-0.8	.15	.15						
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
5008:															
Simel-----	0-2	10-18	1.35-1.50	2-6	0.08-0.12	0.0-2.9	1.0-2.0	.24	.24	1	3	86	6s	---	
	2-7	27-35	1.15-1.30	0.2-0.6	0.16-0.20	3.0-5.9	0.5-1.5	.32	.32						
	7-12	---	---	0.06-0.2	---	---	---	---	---						
	12-22	---	---	0.0015-0.06	---	---	---	---	---						
Simel, steep-----	0-3	27-35	1.15-1.30	0.2-0.6	0.16-0.19	3.0-5.9	0.5-2.0	.32	.32	1	4L	86	6s	---	
	3-8	---	---	0.06-0.2	---	---	---	---	---						
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
5009:															
Wayneco, dry-----	0-5	5-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.24	.24	1	3	86	7s	---	
	5-19	8-18	1.25-1.40	0.6-2	0.13-0.15	0.0-2.9	0.5-1.5	.24	.32						
	19-29	---	---	0.0015-0.06	---	---	---	---	---						
5010:															
Retsabal-----	0-1	8-18	0.90-1.10	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.55	.55	2	3	86	7s	---	
	1-3	8-18	0.90-1.10	2-6	0.15-0.17	0.0-2.9	0.0-0.5	.49	.49						
	3-15	8-18	0.90-1.10	2-6	0.16-0.18	0.0-2.9	0.0-0.5	.43	.43						
	15-25	---	---	0.06-0.2	---	---	---	---	---						
Lemrac-----	0-1	5-18	0.90-1.10	2-6	0.16-0.18	0.0-2.9	0.5-1.0	.43	.43	3	4L	86	5s	---	
	1-19	5-18	0.90-1.10	2-6	0.16-0.18	0.0-2.9	0.0-0.5	.43	.43						
	19-34	5-18	0.90-1.10	2-6	0.16-0.18	0.0-2.9	0.0-0.5	.43	.43						
	34-44	---	---	0.0015-0.06	---	---	---	---	---						
5011:															
Carmel Formation															
Badland-----	0-1	---	---	0.06-0.2	---	---	---	---	---		8	0	8	---	
	1-60	---	---	0.0000-0.2	---	---	---	---	---						
Rizno, cool-----	0-3	18-27	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	0.5-1.0	.20	.37	1	3	86	7s	---	
	3-6	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-0.8	.20	.24						
	6-9	8-18	1.35-1.50	2-6	0.08-0.10	0.0-2.9	0.2-0.8	.15	.24						
	9-19	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5011: Nonip-----	0-5	27-35	1.35-1.40	2-6	0.07-0.09	3.0-5.9	0.5-1.0	.15	.24	1	8	0	7s	---	
	5-15	---	---	0.0015-0.06	---	---	---	---	---						
5012: Santrick-----	0-4	2-6	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.5-1.0	.17	.17	2	2	134	6s	---	
	4-12	2-6	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.5-1.0	.15	.15						
	12-22	2-6	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.0-1.0	.15	.15						
	22-28	2-6	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.0-0.5	.15	.15						
	28-38	---	---	0.0015-0.06	---	---	---	---	---						
Nalcase-----	0-1	0-5	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.2-0.8	.15	.15	1	1	250	7s	---	
	1-6	0-5	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.2-0.8	.15	.15						
	6-16	---	---	0.0015-0.06	---	---	---	---	---						
Bispen-----	0-6	2-5	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15	3	1	250	5c	---	
	6-51	2-5	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.0-1.0	.15	.15						
	51-61	---	---	0.0015-0.06	---	---	---	---	---						
5013: Mido-----	0-4	1-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.17	.17	5	1	250	7s	---	
	4-60	1-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
Yarts-----	0-5	5-9	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.5-1.5	.17	.17	5	2	134	5c	---	
	5-60	8-12	1.35-1.50	2-6	0.06-0.09	0.0-2.9	0.2-1.0	.24	.24						
5015: Mespun-----	0-20	0-4	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	5	1	250	5c	---	
	20-40	0-4	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
	40-60	0-4	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
5017: Skos, dry-----	0-6	3-10	1.45-1.60	6-20	0.07-0.09	0.0-2.9	1.0-2.0	.10	.17	1	5	56	6s	---	
	6-13	20-35	1.35-1.50	0.6-2	0.08-0.10	3.0-5.9	0.5-1.5	.05	.24						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
Mido-----	0-15	1-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	5	1	250	7s	---	
	15-30	1-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15						
	30-45	1-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15						
	45-60	1-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5017: Arches, dry-----	0-4	0-8	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.5-1.0	.17	.17	1	2	134	7s	---	
	4-9	0-8	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.0-1.0	.15	.15						
	9-19	---	---	0.0015-0.06	---	---	---	---	---						
5018: Skos, dry-----	0-2	18-27	1.25-1.40	0.6-2	0.10-0.13	3.0-5.9	1.0-2.0	.17	.32	1	8	0	6s	---	
	2-4	18-27	1.25-1.40	0.6-2	0.10-0.13	3.0-5.9	0.5-2.0	.17	.32						
	4-8	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.5	.10	.32						
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
5019: Skos, dry-----	0-2	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	1.0-2.0	.10	.32	1	8	0	6s	---	
	2-8	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-2.0	.10	.32						
	8-18	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.5	.10	.32						
	18-28	---	---	0.0015-0.06	---	---	---	---	---						
Page Sandstone, Carmel Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
Arches, dry-----	0-3	0-8	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15	1	1	250	7s	---	
	3-10	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15						
	10-13	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.8	.15	.15						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
5020: Navajo Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
Mespu-----	0-5	0-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	5	1	250	5c	---	
	5-40	0-4	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
	40-60	0-4	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.10	.10						
Nalcase-----	0-10	0-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.2-0.8	.10	.10	1	1	220	7s	---	
	10-13	0-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.2-0.8	.10	.10						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5021: Milok, cool-----	0-8	8-18	1.35-1.45	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.28	.28	5	3	86	6e	---	
	8-16	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24						
	16-30	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	30-38	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24						
	38-60	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24						
Anasazi, cool-----	0-3	8-18	1.25-1.40	2-6	0.13-0.17	0.0-2.9	1.0-2.0	.32	.32	2	4L	86	6s	---	
	3-10	8-18	1.25-1.40	2-6	0.13-0.17	0.0-2.9	1.0-2.0	.32	.32						
	10-20	8-18	1.25-1.40	2-6	0.13-0.17	0.0-2.9	0.5-1.5	.32	.32						
	20-30	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.15	.24						
	30-40	---	---	0.0015-0.06	---	---	---	---	---						
5023: Tsaya-----	0-3	18-27	1.25-1.40	2-6	0.10-0.13	3.0-5.9	0.5-1.0	.20	.37	1	5	56	7s	---	
	3-6	18-27	1.25-1.40	2-6	0.07-0.09	3.0-5.9	0.5-1.0	.10	.32						
	6-9	18-27	1.25-1.40	2-6	0.07-0.09	3.0-5.9	0.2-0.5	.10	.32						
	9-19	---	---	0.0015-0.06	---	---	---	---	---						
5025: Yarts-----	0-10	8-18	1.35-1.45	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.17	.17	5	3	86	5c	3e	
	10-60	8-18	1.35-1.40	2-6	0.10-0.14	0.0-2.9	0.0-0.5	.20	.20						
5026: Entrada and Carmel Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5027: Tropic Formation Shale Badland-----	0-1	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---	
	1-60	---	---	0.0000-0.2	---	---	---	---	---	---					
Cannonville-----	0-7	40-50	1.15-1.25	0.06-0.2	0.17-0.18	6.0-8.9	0.0-0.5	.28	.28	1	4	86	7s	---	
	7-17	---	---	0.06-0.2	---	---	---	---	---						
Dakota Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi-	erodi-	NIRR	IRR
											bility group	bility index		
In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5028: Cannonville Member, Entrada Formation Badland-----	0-1	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---
	1-60	---	---	0.0000-0.2	---	---	---	---	---	---				
5029: Straight Cliffs Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
Atchee family, steep	0-3	8-18	1.35-1.50	6-20	0.05-0.09	0.0-2.9	1.0-2.0	.15	.24	1	6	48	5c	---
	3-12	8-18	1.35-1.50	6-20	0.04-0.07	0.0-2.9	0.0-1.0	.05	.20					
	12-17	8-18	1.35-1.50	6-20	0.05-0.09	0.0-2.9	0.0-1.0	.05	.20					
	17-27	---	---	0.0015-0.06	---	---	---	---	---					
Chilton family-----	0-1	8-18	1.45-1.60	2-6	0.05-0.07	0.0-2.9	1.0-2.0	.05	.24	2	6	48	5c	---
	1-4	8-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.0-1.0	.10	.20					
	4-39	8-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.0-1.0	.10	.32					
	39-48	---	---	0.0015-0.06	---	---	---	---	---					
5030: Catahoula-----	0-5	10-20	1.35-1.50	2-6	0.05-0.08	0.0-2.9	0.5-2.0	.05	.20	3	6	48	5s	---
	5-26	18-27	1.25-1.40	2-6	0.08-0.11	3.0-5.9	0.5-2.0	.10	.32					
	26-49	18-27	1.25-1.40	2-6	0.08-0.11	3.0-5.9	0.5-2.0	.10	.32					
	49-60	18-27	1.25-1.40	2-6	0.08-0.11	3.0-5.9	0.5-1.5	.10	.32					
Clapper, dry-----	0-5	12-18	1.35-1.50	2-6	0.06-0.08	0.0-2.9	0.5-2.0	.05	.20	5	6	48	5s	---
	5-13	18-27	1.25-1.40	2-6	0.08-0.11	3.0-5.9	0.5-2.0	.10	.32					
	13-20	18-27	1.25-1.40	2-6	0.08-0.11	3.0-5.9	0.5-1.5	.10	.32					
	20-38	18-27	1.25-1.40	2-6	0.08-0.11	3.0-5.9	0.5-1.5	.10	.32					
	38-60	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	0.5-1.0	.10	.32					
5031: Moclom-----	0-3	1-5	1.50-1.60	6-20	0.04-0.06	0.0-2.9	0.5-1.5	.05	.10	1	2	134	7s	---
	3-10	1-5	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.5	.10	.10					
	10-20	---	---	0.0015-0.06	---	---	---	---	---					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5031: Morrison Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5032: Remorris-----	0-3	27-35	1.25-1.40	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.20	.37	2	4L	86	7s	---	
	3-10	27-35	1.25-1.40	0.2-0.6	0.16-0.18	3.0-5.9	0.5-2.0	.28	.32						
	10-15	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.5	.32	.32						
	15-25	---	---	0.06-0.2	---	---	---	---	---						
Kenzo, steep-----	0-3	8-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	1.0-2.0	.15	.24	1	5	56	7s	---	
	3-8	8-18	1.25-1.40	2-6	0.12-0.14	0.0-2.9	0.5-1.5	.24	.32						
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
Morrison and Entrada Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5033: Yarts, eroded-----	0-4	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-2.0	.17	.17	5	3	86	6e	---	
	4-22	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.5	.17	.17						
	22-60	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.0-0.5	.20	.20						
5034: Nonip-----	0-1	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	0.5-2.0	.10	.32	1	8	0	7e	---	
	1-5	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	0.5-2.0	.10	.32						
	5-15	---	---	0.0015-0.06	---	---	---	---	---						
5035: Earlweed-----	0-4	1-10	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	5	1	250	5c	---	
	4-12	1-10	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.2-0.8	.15	.15						
	12-24	1-10	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.2-0.5	.15	.15						
	24-40	1-10	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
	40-60	1-10	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
Mido-----	0-1	1-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.2-1.0	.15	.15	5	1	250	7s	---	
	1-60	1-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.2-1.0	.15	.15						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5037:															
Barx-----	0-5	8-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-3.0	.28	.28	5	3	86	6e	---	
	5-12	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-2.0	.24	.24						
	12-31	8-18	1.25-1.40	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.20						
	31-48	8-18	1.25-1.40	2-6	0.10-0.12	0.0-2.9	0.0-1.0	.20	.20						
	48-60	8-18	1.25-1.40	2-6	0.10-0.12	0.0-2.9	0.0-1.0	.20	.20						
5038:															
Mido-----	0-4	1-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	5	1	250	7s	---	
	4-60	1-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
Entrada Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5040:															
Sazi-----	0-5	10-18	1.35-1.45	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.28	.28	2	3	86	6s	---	
	5-20	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24						
	20-38	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	38-48	---	---	0.0015-0.06	---	---	---	---	---						
Milok, cool-----	0-4	8-18	1.35-1.45	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.28	.28	5	3	86	6e	---	
	4-18	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24						
	18-32	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	32-60	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24						
5041:															
Seeg, warm-----	0-3	3-10	1.45-1.60	6-20	0.04-0.06	0.0-2.9	0.5-1.0	.10	.17	5	3	86	5c	---	
	3-8	10-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.05	.20						
	8-15	10-20	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.5-1.0	.05	.20						
	15-35	5-10	1.45-1.60	6-20	0.04-0.06	0.0-2.9	0.5-1.0	.05	.15						
	35-60	5-10	1.45-1.60	6-20	0.03-0.05	0.0-2.9	0.2-1.0	.02	.15						
Pagina-----	0-4	8-18	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.5-1.0	.20	.24	3	2	134	6s	---	
	4-17	8-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.15	.20						
	17-25	8-18	1.35-1.50	2-6	0.08-0.10	0.0-2.9	0.2-0.8	.15	.20						
	25-31	8-18	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.2-0.8	.10	.15						
	31-41	---	---	0.0015-0.6	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodibility group	erodibility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5042:															
Moenkopie, warm-----	0-6	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	1	2	134	7s	---	
	6-12	0-8	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.2-1.0	.15	.15						
	12-22	---	---	0.0015-0.06	---	---	---	---	---						
Moepitz-----	0-3	2-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	2	3	86	6s	---	
	3-8	2-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15						
	8-28	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-1.0	.20	.20						
	28-38	---	---	0.0015-0.06	---	---	---	---	---						
Carmel Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5043:															
Daklos, steep-----	0-3	12-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.05	.24	1	6	48	7s	---	
	3-13	12-18	1.35-1.50	2-6	0.08-0.10	0.0-2.9	0.5-2.0	.10	.32						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
Morrison Formation and Romano Mesa Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5044:															
Dient-----	0-4	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.0	.15	.37	5	6	48	5c	---	
	4-12	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.0	.15	.37						
	12-60	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.2-1.0	.10	.32						
5046:															
Moffat-----	0-5	8-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134	5c	---	
	5-13	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.0-0.5	.20	.20						
	13-29	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.0-0.5	.20	.20						
	29-60	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.20	.20						
Sheppard-----	0-5	1-6	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.5-1.0	.24	.24	5	2	134	5c	---	
	5-35	1-6	1.45-1.60	6-20	0.06-0.09	0.0-2.9	0.2-1.0	.15	.15						
	35-60	1-6	1.45-1.60	6-20	0.06-0.09	0.0-2.9	0.2-0.5	.15	.15						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5046: Nakai-----	0-3	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28	5	2	134	5s	---	
	3-10	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28						
	10-20	8-18	1.35-1.50	2-6	0.12-0.15	0.0-2.9	0.2-1.0	.28	.28						
	20-28	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.28	.28						
	28-42	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.28	.28						
	42-60	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.28	.28						
5047: Moffat-----	0-6	7-18	1.45-1.60	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.24	.24	5	2	134	5c	---	
	6-17	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.24	.24						
	17-28	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.24	.24						
	28-41	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.20	.24						
	41-60	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.20	.24						
Seeg, warm-----	0-4	3-10	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-1.0	.15	.24	5	3	86	5c	---	
	4-20	10-20	1.25-1.40	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.32						
	20-30	10-20	1.25-1.40	2-6	0.07-0.09	0.0-2.9	0.2-1.0	.15	.32						
	30-60	10-20	1.35-1.50	2-6	0.07-0.08	0.0-2.9	0.2-1.0	.10	.28						
Mack, moist-----	0-7	8-18	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.5-1.0	.24	.24	5	2	134	5c	---	
	7-12	8-18	1.35-1.50	2-6	0.12-0.15	0.0-2.9	0.5-1.0	.24	.24						
	12-29	18-27	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.2-1.0	.32	.32						
	29-50	8-18	1.35-1.40	2-6	0.09-0.12	0.0-2.9	0.2-1.0	.15	.20						
	50-60	8-18	1.35-1.40	2-6	0.09-0.12	0.0-2.9	0.2-1.0	.15	.20						
5049: Moffat-----	0-3	8-18	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.5-1.0	.24	.24	5	2	134	5c	---	
	3-18	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20						
	18-39	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.20	.20						
	39-60	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.20	.20						
Mack, moist-----	0-6	1-8	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.5-1.0	.24	.24	5	2	134	5c	---	
	6-14	8-18	1.35-1.50	2-6	0.12-0.15	0.0-2.9	0.5-1.0	.24	.24						
	14-25	18-27	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.2-1.0	.32	.32						
	25-40	8-18	1.35-1.50	2-6	0.09-0.12	0.0-2.9	0.2-1.0	.20	.20						
	40-60	8-18	1.35-1.50	2-6	0.09-0.12	0.0-2.9	0.2-1.0	.15	.20						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5050:															
Daklos-----	0-3	12-27	1.25-1.40	0.6-2	0.13-0.16	3.0-5.9	0.5-2.0	.32	.37	1	5	56	7s	---	
	3-10	12-27	1.25-1.40	2-6	0.07-0.09	3.0-5.9	0.2-1.5	.15	.32						
	10-20	---	---	0.0015-0.06	---	---	---	---	---						
Arches, dry-----	0-4	0-8	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.5-2.0	.15	.15	1	1	250	7s	---	
	4-16	0-8	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.2-1.0	.15	.15						
	16-26	---	---	0.0015-0.06	---	---	---	---	---						
5052:															
Yarts-----	0-2	8-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---	
	2-16	8-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.5-1.5	.24	.24						
	16-24	8-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.24	.24						
	24-54	10-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.24	.24						
	54-60	10-18	1.25-1.40	2-6	0.13-0.17	0.0-2.9	0.5-1.0	.28	.28						
Suwanee-----	0-6	18-35	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	1.5-3.0	.37	.37	5	7	38	5c	---	
	6-16	18-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	1.0-2.0	.32	.32						
	16-27	11-35	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-2.0	.32	.32						
	27-36	18-35	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.32	.32						
	36-60	5-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.20						
5053:															
Milok-----	0-7	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15	5	1	250	5c	---	
	7-15	8-18	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.5-1.0	.15	.15						
	15-34	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-0.8	.20	.20						
	34-55	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-0.8	.15	.20						
	55-60	8-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.2-0.8	.15	.20						
5055:															
Mivida-----	0-2	1-5	1.45-1.60	6-20	0.08-0.11	0.0-2.9	1.0-2.0	.24	.24	5	2	134	5c	---	
	2-36	8-18	1.35-1.50	2-6	0.12-0.15	0.0-2.9	0.5-2.0	.24	.24						
	36-60	8-18	1.35-1.50	2-6	0.12-0.15	0.0-2.9	0.5-1.5	.24	.24						
Barx, dry-----	0-4	8-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---	
	4-11	18-27	1.25-1.40	0.6-2	0.15-0.18	3.0-5.9	1.0-2.0	.32	.32						
	11-18	27-35	1.25-1.40	0.2-0.6	0.17-0.20	3.0-5.9	0.5-2.0	.32	.32						
	18-26	27-35	1.25-1.40	0.2-0.6	0.17-0.20	3.0-5.9	0.5-2.0	.32	.32						
	26-60	18-27	1.25-1.40	0.6-2	0.15-0.18	3.0-5.9	0.5-1.5	.32	.32						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5057: Arches, dry-----	0-3	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-2.0	.17	.17	1	2	134	7s	---	
	3-12	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15						
	12-22	---	---	0.0015-0.06	---	---	---	---	---						
Mident-----	0-3	1-5	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-2.0	.15	.15	2	1	250	7s	---	
	3-10	1-5	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.2-1.0	.15	.15						
	10-20	---	---	0.2-0.6	---	---	---	---	---						
Yarts-----	0-4	1-3	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.0-2.0	.17	.17	5	2	134	5c	---	
	4-12	1-6	1.45-1.60	6-20	0.11-0.13	0.0-2.9	1.0-1.5	.24	.24						
	12-42	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-1.0	.24	.24						
	42-60	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-1.0	.24	.24						
5058: Earlweed-----	0-4	1-10	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	5	2	134	5c	---	
	4-22	1-10	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.2-0.5	.15	.15						
	22-36	1-10	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.1-0.5	.15	.15						
	36-50	1-10	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.1-0.5	.15	.15						
	50-60	1-10	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.1-0.5	.15	.15						
Mivida-----	0-2	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.0-2.0	.17	.17	5	2	134	5c	---	
	2-10	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24						
	10-21	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-2.0	.24	.24						
	21-28	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	28-50	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	50-60	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24						
5059: Mivida-----	0-8	1-6	1.45-1.60	6-20	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---	
	8-16	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24						
	16-28	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	28-42	8-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.5-1.5	.20	.20						
	42-60	8-18	1.35-1.50	2-6	0.14-0.16	0.0-2.9	0.5-1.0	.32	.32						
Yarts, moist-----	0-6	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---	
	6-60	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-1.0	.24	.24						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5060:															
Ranion-----	0-7	1-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134	5c	---	
	7-29	1-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15						
	29-60	1-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15						
Suzipon-----	0-3	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	1	2	134	7s	---	
	3-8	1-6	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15						
	8-12	1-6	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15						
	12-22	---	---	0.0015-0.06	---	---	---	---	---						
Navajo Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5061:															
Navajo Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
Suzipon-----	0-8	1-6	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.17	.17	1	2	134	7s	---	
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
Peekaboo-----	0-3	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	2	2	134	6s	---	
	3-22	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15						
	22-32	---	---	0.0015-0.06	---	---	---	---	---						
5062:															
Peekaboo-----	0-4	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	2	2	134	6s	---	
	4-12	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15						
	12-29	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.5	.15	.15						
	29-39	---	---	0.0015-0.06	---	---	---	---	---						
Spooky-----	0-4	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	3	2	134	5c	---	
	4-14	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15						
	14-38	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15						
	38-46	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.5	.15	.15						
	46-56	---	---	0.0015-0.06	---	---	---	---	---						
Suzipon-----	0-4	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	1	2	134	7s	---	
	4-19	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15						
	19-29	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi-	erodi-	NIRR	IRR
											bility	bility		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct				group	index		
5063: Navajo Sandstone and Carmel Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
Moenkopie, warm-----	0-6	8-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.20	.37	1	4L	86	7s	---
	6-13	8-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.2-1.0	.17	.32					
	13-16	---	---	0.2-0.6	---	---	---	---	---					
	16-26	---	---	0.0015-0.06	---	---	---	---	---					
Needle-----	0-5	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	1	2	134	6s	---
	5-13	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.5	.15	.15					
	13-23	---	---	0.0015-0.06	---	---	---	---	---					
5065: Trail-----	0-12	1-5	1.50-1.60	6-20	0.08-0.10	0.0-2.9	0.5-2.0	.17	.17	5	2	134	5c	---
	12-29	1-5	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.5-2.0	.15	.15					
	29-46	1-5	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.5-2.0	.15	.15					
	46-60	1-5	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.5	.10	.10					
Sheppard-----	0-6	1-8	1.50-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134	5c	---
	6-32	1-6	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15					
	32-60	1-6	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.5	.15	.15					
5067: Ranion-----	0-5	1-8	1.50-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134	5c	---
	5-15	1-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15					
	15-35	1-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15					
	35-55	1-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15					
	55-60	1-8	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.10	.10					
Peekaboo-----	0-4	1-5	1.50-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	2	2	134	6s	---
	4-23	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15					
	23-28	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15					
	28-38	---	---	0.0015-0.06	---	---	---	---	---					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5068:															
Seeg, warm-----	0-5	1-10	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15	5	3	86	5c	---	
	5-12	8-20	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.24						
	12-19	10-20	1.35-1.50	2-6	0.12-0.14	0.0-2.9	0.2-1.0	.17	.32						
	19-38	10-20	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.2-0.5	.10	.32						
	38-60	10-20	1.35-1.50	2-6	0.06-0.09	0.0-2.9	0.2-0.5	.15	.24						
Moffat-----	0-5	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134	5c	---	
	5-19	8-18	1.35-1.50	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15						
	19-35	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-1.0	.24	.24						
	35-55	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-0.5	.24	.24						
	55-60	8-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.2-0.5	.24	.24						
Needle-----	0-4	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	1	2	134	6s	---	
	4-11	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.5	.15	.15						
	11-17	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.5	.15	.15						
	17-27	---	---	0.0015-0.06	---	---	---	---	---						
5069:															
Entrada Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
Nepalto, moist-----	0-16	0-8	1.45-1.60	6-20	0.04-0.06	0.0-2.9	0.1-1.0	.10	.17	3	2	56	6s	---	
	16-34	0-8	1.45-1.60	20-100	0.02-0.04	0.0-2.9	0.0-0.0	.02	.10						
	34-52	0-8	1.45-1.60	20-100	0.02-0.04	0.0-2.9	0.0-0.0	.02	.10						
	52-60	0-8	1.45-1.60	20-100	0.02-0.04	0.0-2.9	0.0-0.0	.02	.10						
5071:															
Somorent-----	0-5	8-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.24	2	3	86	7s	---	
	5-12	8-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-1.0	.17	.20						
	12-22	---	---	0.2-0.6	---	---	---	---	---						
Morrison Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5073:															
Kenzo-----	0-4	0-8	1.45-1.60	6-20	0.05-0.09	0.0-2.9	1.0-2.0	.17	.17	1	2	134	7s	---	
	4-8	8-18	1.35-1.50	2-6	0.09-0.13	0.0-2.9	0.2-1.2	.15	.15						
	8-15	8-18	1.35-1.50	2-6	0.06-0.10	0.0-2.9	0.2-1.2	.10	.15						
	15-25	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5073: Nalcase-----	0-7	0-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	1	1	250	7s	---	
	7-12	0-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15						
	12-17	0-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
	17-27	---	---	0.0015-0.06	---	---	---	---	---						
5074: Evpark-----	0-6	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.5-3.0	.28	.28	2	3	86	5c	---	
	6-12	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.5	.20	.20						
	12-16	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.32	.32						
	16-23	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.32	.32						
	23-33	---	---	0.0015-0.06	---	---	---	---	---						
Vessilla-----	0-2	8-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.5-3.0	.28	.28	1	3	86	5c	---	
	2-8	8-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	8-16	8-20	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.5-1.5	.20	.24						
	16-26	---	---	0.0015-0.06	---	---	---	---	---						
5075: Shalona-----	0-8	8-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	2.0-4.0	.24	.24	5	3	86	5c	---	
	8-13	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	2.0-4.0	.32	.32						
	13-29	27-40	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	1.0-3.0	.32	.32						
	29-43	27-40	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-2.0	.32	.32						
	43-60	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-2.0	.32	.32						
5076: Daklos-----	0-4	12-18	1.25-1.50	2-6	0.06-0.08	0.0-2.9	1.0-2.0	.05	.24	1	6	48	7s	---	
	4-8	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	0.5-1.5	.05	.32						
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
Catahoula-----	0-4	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	1.0-2.0	.10	.37	3	6	48	5s	---	
	4-29	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	0.5-2.0	.10	.32						
	29-60	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	0.5-1.5	.10	.32						
5077: Gompers family-----	0-4	18-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.5-3.0	.20	.37	1	8	0	6e	---	
	4-13	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.0	.10	.32						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR
	In	Pct	g/cc	In/hr	In/in	Pct	Pct							
5077: Straight Cliffs Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
Sheecal family-----	0-4	8-20	1.35-1.50	2-6	0.06-0.08	0.0-2.9	1.5-3.0	.15	.24	2	6	48	6e	---
	4-15	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.0	.17	.32					
	15-34	27-40	1.25-1.40	0.2-0.6	0.10-0.12	3.0-5.9	0.5-1.0	.17	.32					
	34-44	---	---	0.0015-0.06	---	---	---	---	---					
5078: Arabrab-----	0-2	5-10	1.35-1.50	2-6	0.14-0.16	0.0-2.9	1.5-3.0	.20	.24	1	3	86	7s	---
	2-7	18-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.5-1.0	.24	.32					
	7-16	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.0	.24	.32					
	16-26	---	---	0.0015-0.06	---	---	---	---	---					
Vessilla-----	0-6	5-15	1.45-1.60	6-20	0.07-0.09	0.0-2.9	1.5-3.0	.17	.17	1	2	134	7s	---
	6-15	8-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.20					
	15-19	8-20	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.15	.20					
	19-28	---	---	0.0015-0.06	---	---	---	---	---					
Colskel-----	0-4	8-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	1.5-3.0	.15	.24	1	5	56	7s	---
	4-10	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.0	.10	.32					
	10-20	---	---	0.0015-0.06	---	---	---	---	---					
5079: Colskel-----	0-7	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	1.5-3.0	.10	.37	1	8	0	7s	---
	7-18	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.0	.10	.32					
	18-28	---	---	0.0015-0.06	---	---	---	---	---					
Arabrab-----	0-5	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.5-3.0	.20	.28	1	3	86	7s	---
	5-10	18-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.24	.32					
	10-19	27-35	1.25-1.40	0.2-0.6	0.16-0.18	3.0-5.9	0.5-1.0	.24	.32					
	19-29	---	---	0.0015-0.06	---	---	---	---	---					
Vessilla-----	0-2	5-15	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.5-3.0	.15	.17	1	3	86	6s	---
	2-8	8-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.10	.20					
	8-18	---	---	0.0015-0.06	---	---	---	---	---					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class			
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR		
								In	Pct	In/hr	In/in	Pct	Pct			
5080:																
Moffat-----	0-5	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.24	.24	5	3	86	5c	---		
	5-17	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-1.0	.20	.20							
	17-29	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-1.0	.20	.20							
	29-60	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-1.0	.20	.20							
Moepitz-----	0-7	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.24	.24	2	3	86	6s	---		
	7-34	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-1.0	.20	.20							
	34-44	---	---	0.0015-0.06	---	---	---	---	---							
5081:																
Straight Cliffs and Wahweap Formation Badland-----	0-60	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---		
Straight Cliffs and Wahweap Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---		
Kydestea family-----	0-7	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	1.5-3.0	.05	.37	1	8	0	7s	---		
	7-19	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.0	.05	.32							
	19-28	---	---	0.0015-0.06	---	---	---	---	---							
5082:																
Colskel-----	0-3	18-27	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	1.5-3.0	.20	.37	1	6	48	7s	---		
	3-7	18-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	0.5-1.2	.10	.32							
	7-14	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.2	.10	.32							
	14-24	---	---	0.0015-0.06	---	---	---	---	---							
Menefee-----	0-8	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	1.5-3.0	.10	.37	1	6	48	7s	---		
	8-13	---	---	0.0015-0.06	---	---	---	---	---							
	13-23	---	---	0.0015-0.06	---	---	---	---	---							
Arabrab-----	0-4	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.5-3.0	.24	.24	1	3	86	7s	---		
	4-9	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32							
	9-17	18-27	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.5	.20	.24							
	17-26	---	---	0.0015-0.06	---	---	---	---	---							

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5083:															
Colskel-----	0-2	8-18	1.35-1.50	2-6	0.06-0.08	0.0-2.9	1.5-3.0	.05	.24	1	5	56	7s	---	
	2-8	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.8-1.5	.10	.32						
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
Menefee-----	0-3	18-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	1.5-3.0	.20	.37	1	6	48	7s	---	
	3-8	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.32	.32						
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
5085:															
Hillburn-----	0-2	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	1.0-2.0	.10	.37	1	8	0	7s	---	
	2-7	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.2	.10	.32						
	7-13	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.2	.10	.32						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
5086:															
Mespuu-----	0-4	0-4	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	5	1	250	5c	---	
	4-41	0-4	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
	41-60	0-4	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
Bispen-----	0-4	0-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	3	1	250	5c	---	
	4-52	0-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
	52-62	---	---	0.0015-0.06	---	---	---	---	---						
Santrick-----	0-3	0-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	2	1	250	6s	---	
	3-24	0-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
	24-34	---	---	0.0015-0.06	---	---	---	---	---						
5087:															
Kenzo, steep-----	0-4	8-18	1.45-1.60	6-20	0.05-0.07	0.0-2.9	1.0-2.0	.10	.17	1	3	86	7s	---	
	4-11	8-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.2-1.0	.10	.20						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						
Kayenta Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5088:															
Calcee-----	0-8	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	2	1	220	6s	---	
	8-15	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.2-1.8	.15	.15						
	15-27	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.2-1.8	.15	.15						
	27-37	---	---	0.0015-0.06	---	---	---	---	---						
Bowington-----	0-16	0-8	1.45-1.60	20-100	0.05-0.07	0.0-2.9	1.0-2.0	.15	.15	5	1	250	6w	---	
	16-46	0-8	1.45-1.60	20-100	0.05-0.07	0.0-2.9	0.2-1.8	.15	.15						
	46-60	0-8	1.45-1.60	20-100	0.05-0.07	0.0-2.9	0.2-1.8	.15	.15						
Mespu-----	0-2	0-4	1.45-1.60	20-100	0.05-0.07	0.0-2.9	1.0-2.0	.15	.15	5	1	250	5c	---	
	2-60	0-4	1.45-1.60	20-100	0.05-0.07	0.0-2.9	0.2-1.8	.15	.15						
5089:															
Bowington-----	0-2	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	5	1	250	6w	---	
	2-37	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.2-1.8	.15	.15						
	37-49	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.2-1.8	.15	.15						
	49-60	5-15	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.2-1.8	.15	.15						
	60-62	5-15	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.2-1.8	.10	.15						
Mespu-----	0-6	0-4	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	5	1	250	5c	---	
	6-11	0-4	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.0-1.0	.15	.15						
	11-24	0-4	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.0-1.0	.15	.15						
	24-60	0-4	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.0-1.0	.15	.15						
5090:															
Baldfield, saline---	0-2	35-50	1.15-1.20	0.06-0.2	0.17-0.18	6.0-8.9	0.5-1.0	.32	.32	5	4	86	6s	---	
	2-4	35-50	1.15-1.20	0.06-0.2	0.17-0.18	6.0-8.9	0.0-1.0	.32	.32						
	4-15	35-50	1.15-1.20	0.06-0.2	0.17-0.18	6.0-8.9	0.0-1.0	.28	.28						
	15-60	35-50	1.15-1.20	0.06-0.2	0.17-0.18	6.0-8.9	0.0-1.0	.28	.28						
5091:															
Brumley-----	0-7	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.5-3.0	.28	.28	5	3	86	5c	---	
	7-17	27-35	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32						
	17-27	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	1.0-2.0	.32	.32						
	27-44	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.8-1.2	.24	.32						
	44-60	20-27	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.8-1.2	.20	.24						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR
	In	Pct	g/cc	In/hr	In/in	Pct	Pct							
5092: Navajo Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
Navigon-----	0-4	0-8	1.45-1.60	20-100	0.02-0.04	0.0-2.9	1.0-2.0	.02	.15	1	8	0	7s	---
	4-8	0-8	1.45-1.60	20-100	0.02-0.04	0.0-2.9	0.2-1.2	.05	.15					
	8-18	---	---	0.0015-0.06	---	---	---	---	---					
5093: Robay-----	0-3	1-6	1.45-1.60	20-100	0.02-0.04	0.0-2.9	1.5-3.0	.05	.15	1	3	86	7s	---
	3-10	1-6	1.45-1.60	20-100	0.03-0.05	0.0-2.9	1.0-2.0	.05	.15					
	10-20	---	---	0.0015-0.06	---	---	---	---	---					
Strell-----	0-3	0-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.5-3.0	.17	.17	1	2	134	7s	---
	3-10	0-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15					
	10-20	---	---	0.0015-0.06	---	---	---	---	---					
5094: Aridic Ustorthents--	0-7	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	1.5-3.0	.10	.37	5	7	38	5s	---
	7-15	18-27	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	1.0-2.0	.24	.32					
	15-33	18-27	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	0.2-0.8	.17	.32					
	33-60	27-35	1.25-1.40	0.2-0.6	0.10-0.12	3.0-5.9	0.2-0.8	.10	.32					
Yatne-----	0-6	18-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.5-3.0	.20	.37	3	6	48	5s	---
	6-15	18-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.0-2.0	.10	.32					
	15-27	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.2-1.2	.10	.32					
	27-37	18-27	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.2-1.2	.17	.32					
	37-45	27-40	1.25-1.40	0.2-0.6	0.12-0.14	3.0-5.9	0.2-0.8	.17	.32					
	45-60	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.2-0.8	.10	.32					
5095: Daklos-----	0-2	12-18	1.35-1.50	2-6	0.08-0.10	0.0-2.9	1.5-3.0	.20	.24	1	3	86	6s	---
	2-6	12-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.0-2.0	.24	.32					
	6-13	12-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.0	.10	.32					
	13-22	---	---	0.0015-0.06	---	---	---	---	---					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5095:															
Hideout-----	0-3	5-18	1.35-1.50	2-6	0.08-0.10	0.0-2.9	1.0-2.0	.20	.24	1	5	56	6s	---	
	3-6	5-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.5-1.5	.10	.20						
	6-9	---	---	0.2-0.6	---	---	---	---	---						
	9-19	---	---	0.0015-0.06	---	---	---	---	---						
Straight Cliffs Formation Sandstone															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5096:															
Daklos, steep-----	0-4	12-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	1.0-2.0	.05	.24	1	6	48	6s	---	
	4-11	12-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.0	.10	.32						
	11-20	---	---	0.0015-0.06	---	---	---	---	---						
Straight Cliffs Formation Sandstone															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5097:															
Skyvillage-----	0-3	8-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.20	.28	1	8	0	6s	---	
	3-8	10-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.20	.24						
	8-12	---	---	0.0015-0.06	---	---	---	---	---						
	12-22	---	---	0.0015-0.06	---	---	---	---	---						
Daklos, saline-----	0-3	12-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	1.0-2.0	.20	.37	1	5	56	6s	---	
	3-11	12-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.0	.05	.32						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						
Wahweap Formation															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5098:															
Daklos, saline-----	0-5	8-18	1.35-1.50	6-20	0.07-0.09	0.0-2.9	1.0-2.0	.15	.24	1	5	56	6s	---	
	5-10	12-18	1.35-1.50	2-6	0.06-0.08	0.0-2.9	0.0-0.0	.05	.20						
	10-20	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5098:															
Skyvillage, saline--	0-2	8-20	1.35-1.50	2-6	0.09-0.11	0.0-2.9	1.5-3.0	.20	.24	1	4	86	6s	---	
	2-7	8-20	1.35-1.50	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.05	.20						
	7-17	---	---	0.0015-0.06	---	---	---	---	---						
Cannonville-----	0-4	40-50	1.15-1.30	0.06-0.2	0.17-0.19	6.0-8.9	0.2-0.8	.32	.32	1	4	86	7s	---	
	4-11	40-50	1.15-1.30	0.06-0.2	0.17-0.19	6.0-8.9	0.0-0.5	.28	.28						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						
5100:															
Wingate Formation															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---		8	0	8	---	
Arches, dry-----	0-1	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	1	1	180	7s	---	
	1-7	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24						
	7-8	---	---	0.2-0.6	---	---	---	---	---						
	8-18	---	---	0.0015-0.06	---	---	---	---	---						
5101:															
Polychrome family---	0-18	0-8	1.45-1.60	20-100	0.02-0.04	0.0-2.9	1.0-2.0	.05	.15	3	1	220	7s	---	
	18-31	10-20	1.35-1.50	6-20	0.02-0.04	0.0-2.9	0.5-1.0	.02	.24						
	31-41	---	---	0.06-0.2	---	---	---	---	---						
Chinle Formation															
Badland-----	0-1	---	---	0.06-0.2	---	---	---	---	---		8	0	8	---	
	1-60	---	---	0.06-0.2	---	---	---	---	---						
Gaddes family-----	0-1	8-18	1.25-1.40	0.6-2	0.06-0.08	0.0-2.9	1.0-2.0	.05	.37	3	8	0	5s	---	
	1-18	8-18	1.25-1.40	0.6-2	0.09-0.11	0.0-2.9	0.5-1.0	.10	.32						
	18-32	18-35	1.25-1.40	0.2-0.6	0.16-0.18	3.0-5.9	0.0-0.0	.24	.32						
	>32	---	---	0.06-0.2	---	---	---	---	---						
5102:															
Chinchin-----	0-4	8-27	1.25-1.40	0.6-2	0.13-0.17	3.0-5.9	1.0-2.0	.05	.37	1	8	0	7s	---	
	4-10	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.0	.32	.32						
	10-20	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi-	erodi-	NIRR	IRR
											bility	bility		
In	Pct	g/cc	In/hr	In/in	Pct	Pct				group	index			
5102: Chinle Formation Badland-----	0-1	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---
	1-60	---	---	0.06-0.2	---	---	---	---	---	---				
5103: Barx-----	0-3	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---
	3-9	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-0.8	.20	.20					
	9-28	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.0	.20	.24					
	28-35	18-27	1.25-1.40	0.2-0.6	0.16-0.18	3.0-5.9	0.0-0.0	.32	.32					
	35-60	18-27	1.15-1.30	0.2-0.6	0.17-0.19	3.0-5.9	0.0-0.0	.37	.37					
Remorris-----	0-1	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	1.0-2.0	.05	.37	1	8	0	7s	---
	1-6	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.0	.32	.32					
	6-9	---	---	0.06-0.2	---	---	---	---	---					
	9-19	---	---	0.06-0.2	---	---	---	---	---					
5104: Shinarump Member, Chinle Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
Hideout-----	0-1	5-18	1.45-1.60	6-20	0.02-0.04	0.0-2.9	1.0-2.0	.05	.17	1	8	0	6s	---
	1-5	5-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.20					
	5-9	---	---	0.2-0.6	---	---	---	---	---					
	9-19	---	---	0.0015-0.06	---	---	---	---	---					
5105: Atchee-----	0-1	5-12	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.10	.17	1	6	48	7s	---
	1-4	5-18	1.35-1.50	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.05	.24					
	4-12	5-18	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.0-0.8	.05	.24					
	12-15	---	---	0.0015-0.06	---	---	---	---	---					
	15-24	---	---	0.0015-0.06	---	---	---	---	---					
Lazear, dry-----	0-4	18-35	1.25-1.40	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.32	.37	1	6	48	7s	---
	4-15	---	---	0.2-0.6	---	---	---	---	---					
	15-25	---	---	0.0015-0.06	---	---	---	---	---					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR
	In	Pct	g/cc	In/hr	In/in	Pct	Pct							
5105: Shinarump Member, Chinle Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
5106: Hillburn, dry-----	0-2	18-27	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	1.0-2.0	.20	.37	1	8	0	6s	---
	2-7	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.0	.10	.37					
	7-15	15-27	1.25-1.40	0.2-0.6	0.07-0.09	0.0-2.9	0.5-1.0	.05	.37					
	15-24	---	---	0.0015-0.06	---	---	---	---	---					
Moenkopi Formation Badland-----	0-60	---	---	0.06-0.2	---	---	---	.55	.55	---	8	0	8	---
5107: Simel-----	0-1	20-27	1.25-1.40	0.2-0.6	0.12-0.14	3.0-5.9	1.0-2.0	.24	.43	1	5	56	6s	---
	1-4	20-27	1.15-1.30	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.5	.37	.37					
	4-6	---	---	0.06-0.2	---	---	---	---	---					
	6-13	---	---	0.06-0.2	---	---	---	---	---					
	13-23	---	---	0.0015-0.06	---	---	---	---	---					
Hillburn, dry-----	0-2	27-35	1.25-1.40	0.2-0.6	0.11-0.13	3.0-5.9	1.0-2.0	.10	.37	1	8	0	6s	---
	2-6	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.5	.05	.32					
	6-16	---	---	0.0015-0.06	---	---	---	---	---					
5108: Hillburn, dry-----	0-1	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	1.0-2.0	.05	.37	1	8	0	6s	---
	1-6	18-27	1.15-1.30	0.2-0.6	0.11-0.13	3.0-5.9	0.5-1.0	.10	.37					
	6-9	---	---	0.2-0.6	---	---	---	---	---					
	9-19	---	---	0.0015-0.06	---	---	---	---	---					
Moenkopi Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
5109: Nonip, dry-----	0-1	18-27	1.25-1.40	2-6	0.07-0.09	0.0-2.9	1.0-2.0	.05	.37	1	8	0	6s	---
	1-3	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.0	.10	.32					
	3-6	18-27	1.15-1.30	0.6-2	0.09-0.11	3.0-5.9	0.0-0.5	.10	.37					
	6-15	---	---	0.0015-0.06	---	---	---	---	---					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi-	erodi-	NIRR	IRR
											bility	bility		
In	Pct	g/cc	In/hr	In/in	Pct	Pct				group	index			
5109: Moenkopi Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
5110: Reef-----	0-1	8-18	1.35-1.50	2-6	0.06-0.08	0.0-2.9	1.0-2.0	.15	.24	1	6	48	6s	---
	1-5	8-18	1.25-1.40	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.05	.32					
	5-9	8-20	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.0-0.0	.05	.32					
	9-19	---	---	0.0015-0.06	---	---	---	---	---					
5111: Nonip, dry-----	0-1	8-18	1.35-1.50	2-6	0.05-0.07	0.0-2.9	1.0-2.0	.05	.24	1	8	0	6s	---
	1-4	27-35	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.5-1.0	.17	.32					
	4-7	40-50	1.25-1.40	0.0015-0.06	0.07-0.09	6.0-8.9	0.0-0.0	.02	.28					
	7-17	---	---	0.0015-0.06	---	---	---	---	---					
5112: Barx-----	0-3	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---
	3-9	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.0	.32	.32					
	9-35	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32					
	35-60	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.0	.32	.32					
Radnik, moist-----	0-3	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---
	3-6	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.0	.32	.32					
	6-16	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.24	.24					
	16-18	0-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.0-0.0	.15	.15					
	18-35	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.24	.24					
	35-45	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.0	.32	.32					
	45-55	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.0	.15	.15					
	55-60	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.0	.32	.32					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5112: Progresso, dry-----	0-3	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.24	.24	2	3	86	6s	---	
	3-16	27-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.32	.32						
	16-39	18-27	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.0-0.0	.24	.24						
	39-48	---	---	0.0015-0.06	---	---	---	---	---						
5114: Meriwhitica, moist--	0-2	8-18	1.25-1.40	0.6-2	0.11-0.13	0.0-2.9	1.0-2.0	.10	.37	1	8	0	7s	---	
	2-4	8-18	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.0	.10	.32						
	4-14	---	---	0.0015-0.06	---	---	---	---	---						
Mellenthin-----	0-2	8-18	1.35-1.50	2-6	0.05-0.07	0.0-2.9	1.0-2.0	.05	.24	1	8	0	6s	---	
	2-6	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.5	.05	.32						
	6-16	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.0	.05	.32						
	16-26	---	---	0.0015-0.06	---	---	---	---	---						
5115: Sanostee, warm-----	0-4	7-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	2	3	86	5s	---	
	4-8	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-2.0	.24	.24						
	8-38	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-2.0	.24	.24						
	38-39	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.5	.17	.32						
	39-49	---	---	0.0015-0.06	---	---	---	---	---						
Daklos-----	0-2	12-18	1.35-1.50	2-6	0.08-0.10	0.0-2.9	1.5-3.0	.20	.24	1	3	86	6s	---	
	2-6	12-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.0-2.0	.24	.32						
	6-13	12-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.0	.10	.32						
	13-22	---	---	0.0015-0.06	---	---	---	---	---						
Hideout-----	0-4	5-18	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.15	.17	1	2	134	6s	---	
	4-6	5-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.15	.20						
	6-11	5-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.5-1.5	.05	.20						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR
								In	Pct	In/hr	In/in	Pct	Pct	
5116: Stent-----	0-4	8-20	1.35-1.50	2-6	0.08-0.10	0.0-2.9	0.5-1.0	.05	.28	2	4L	86	5c	---
	4-9	8-22	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	0.5-1.0	.17	.32					
	9-20	8-22	1.25-1.40	2-6	0.09-0.11	3.0-5.9	0.2-0.8	.05	.24					
	20-25	8-20	1.35-1.50	2-6	0.06-0.08	0.0-2.9	0.2-0.8	.05	.20					
	25-35	8-20	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.2-0.8	.10	.20					
	35-46	8-22	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.2-0.8	.10	.32					
	46-72	8-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.0-0.5	.15	.24					
	72-79	8-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.0-0.5	.10	.20					
Minchey-----	0-2	2-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.24	.24	4	2	134	5c	---
	2-6	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24					
	6-24	18-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.2-0.8	.20	.24					
	24-40	18-27	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.2-0.8	.15	.24					
	40-49	8-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.0-0.5	.10	.20					
	49-60	8-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.0-0.5	.15	.20					
5117: Sheppard-----	0-5	1-10	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.24	.24	5	2	134	5c	---
	5-28	1-10	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15					
	28-60	1-10	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.2-0.5	.10	.15					
Carmel and Entrada Formation Badland--	0-1	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---
	1-60	---	---	0.0000-0.2	---	---	---	---	---					
5118: Mido-----	0-29	1-5	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.17	.17	5	2	134	7s	---
	29-60	1-5	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15					
Kenzo-----	0-2	8-18	1.45-1.60	6-20	0.05-0.07	0.0-2.9	1.0-2.0	.10	.17	1	6	48	7s	---
	2-11	8-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.2-1.0	.10	.20					
	11-21	---	---	0.0015-0.06	---	---	---	---	---					
Carmel Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5120:															
Pinepoint-----	0-19	1-5	1.45-1.60	20-100	0.07-0.09	0.0-2.9	1.2-2.8	.15	.15	5	2	134	7s	---	
	19-38	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15						
	38-60	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15						
Flatnose-----	0-13	8-18	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15	5	1	250	7s	---	
	13-16	8-18	1.35-1.50	2-6	0.09-0.15	0.0-2.9	1.2-2.8	.24	.24						
	16-31	8-20	1.25-1.40	0.6-2	0.14-0.20	3.0-5.9	1.4-3.0	.32	.32						
	31-41	8-18	1.45-1.60	6-20	0.05-0.11	0.0-2.9	1.0-2.0	.15	.15						
	41-52	1-8	1.45-1.60	20-100	0.03-0.09	0.0-2.9	1.3-2.9	.10	.10						
	52-60	8-18	1.15-1.30	0.2-0.6	0.15-0.21	3.0-5.9	1.2-2.8	.37	.37						
5121:															
Trail-----	0-11	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134	5c	---	
	11-29	1-5	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15						
	29-60	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15						
Riverwash-----	---	---	---	---	---	---	---	---	---	---	---	---	8	---	
5122:															
Mido-----	0-4	1-5	1.50-1.60	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.15	.15	5	1	250	7s	---	
	4-16	1-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
	16-60	1-5	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15						
Mivida-----	0-5	8-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.0-2.0	.24	.24	5	2	134	5c	---	
	5-23	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-2.0	.20	.20						
	23-38	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.20	.24						
	38-60	8-18	1.25-1.40	2-6	0.14-0.16	0.0-2.9	0.0-0.0	.24	.32						
5123:															
Billings-----	0-4	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.5	.37	.37	5	4	86	5e	---	
	4-27	27-35	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	0.0-1.0	.32	.32						
	27-31	27-35	1.25-1.40	0.2-0.6	0.16-0.18	3.0-5.9	0.0-1.0	.24	.32						
	31-43	27-35	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	0.0-1.0	.32	.32						
	43-64	27-36	1.15-1.30	0.06-0.2	0.17-0.19	6.0-8.9	0.0-1.0	.24	.32						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5123: Jocity, saline-----	0-4	15-27	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.5	.20	.28	4	3	86	5c	---	
	4-20	18-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.0-0.0	.24	.32						
	20-33	15-27	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.0-0.0	.10	.20						
	33-37	18-27	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.24	.24						
	37-46	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.0	.32	.32						
	46-73	18-27	1.35-1.50	2-6	0.10-0.12	3.0-5.9	0.0-0.0	.20	.24						
	73-79	15-27	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.0-0.0	.20	.24						
5125: Clapper-----	0-3	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-2.0	.10	.37	5	6	48	5c	---	
	3-10	18-27	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.5-2.0	.17	.32						
	10-21	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.5	.10	.32						
	21-38	18-27	1.25-1.40	0.6-2	0.09-0.12	3.0-5.9	0.5-1.5	.10	.32						
	38-60	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.0	.05	.32						
5126: Pinepoint-----	0-6	1-5	1.45-1.60	20-100	0.07-0.09	0.0-2.9	1.5-3.0	.15	.15	5	2	134	7s	---	
	6-15	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15						
	15-60	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15						
Parkwash-----	0-6	1-5	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15	1	2	134	7s	---	
	6-13	1-5	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
5127: Skyvillage-----	0-3	5-15	1.45-1.60	6-20	0.07-0.09	0.0-2.9	1.0-2.0	.17	.17	1	2	134	6s	---	
	3-8	5-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.20						
	8-13	10-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.24	.32						
	13-22	---	---	0.0015-0.06	---	---	---	---	---						
Mikim-----	0-7	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.37	.37	5	4L	86	5c	---	
	7-31	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.32	.32						
	31-43	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						
	43-60	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodibility group	erodibility index	NIRR	IRR
	In	Pct	g/cc	In/hr	In/in	Pct	Pct							
5127:														
Kaiparowits Formation Badland--	0-1	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---
	1-60	---	---	0.0000-0.2	---	---	---	---	---	---				
5128:														
Curecanti family----	0-6	18-35	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.5-3.0	.32	.37	3	6	48	5c	---
	6-11	18-35	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	1.5-3.0	.24	.32					
	11-20	18-35	1.25-1.40	0.2-0.6	0.12-0.14	3.0-5.9	1.0-2.0	.17	.32					
	20-32	18-35	1.25-1.40	0.2-0.6	0.10-0.12	3.0-5.9	0.5-1.0	.10	.32					
	32-42	---	---	0.0015-0.06	---	---	---	---	---					
Zibetod family-----	0-4	20-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	1.5-3.0	.32	.37	1	5	56	6c	---
	4-9	20-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	1.5-3.0	.24	.32					
	9-18	27-40	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	1.0-2.0	.10	.32					
	18-28	---	---	0.0015-0.06	---	---	---	---	---					
5129:														
Skyvillage-----	0-1	5-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.24	.24	1	3	86	6s	---
	1-6	5-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.20	.20					
	6-9	20-35	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.0	.20	.24					
	9-19	---	---	0.0015-0.06	---	---	---	---	---					
Wahweap Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
5130:														
Progresso-----	0-2	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.24	.24	2	3	86	6s	---
	2-12	18-27	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.24	.24					
	12-16	27-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.24	.24					
	16-22	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.32	.32					
	22-32	---	---	0.0015-0.06	---	---	---	---	---					
Begay, dry-----	0-2	2-15	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.0-2.0	.17	.17	5	2	134	5c	---
	2-8	2-15	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.0-2.0	.15	.15					
	8-33	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24					
	33-57	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-0.8	.24	.24					
	57-60	8-18	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	0.2-0.8	.32	.32					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR
	In	Pct	g/cc	In/hr	In/in	Pct	Pct							
5131: Kaiparowits Formation Badland--	0-1	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---
	1-60	---	---	0.0000-0.2	---	---	---	---	---	---				
Lazear, steep-----	0-2	18-35	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.0-2.0	.20	.37	1	8	0	6s	---
	2-6	18-35	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.0-0.0	.17	.32					
	6-10	---	---	0.2-0.6	---	---	---	---	---					
	10-20	---	---	0.0015-0.06	---	---	---	---	---					
5132: Strych-----	0-2	8-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	1.0-2.0	.15	.28	4	4L	86	5c	---
	2-4	8-20	1.35-1.50	2-6	0.08-0.10	0.0-2.9	0.5-1.5	.15	.24					
	4-7	8-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.2-0.8	.05	.24					
	7-35	8-20	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.2-0.8	.05	.20					
	35-56	8-27	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.2-0.8	.17	.32					
	56-65	8-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.2-0.8	.15	.24					
Horsemountain-----	0-4	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.20	.28	2	3	86	7s	---
	4-7	18-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.5	.24	.32					
	7-14	18-27	1.35-1.50	2-6	0.08-0.10	0.0-2.9	0.5-1.5	.15	.24					
	14-19	5-18	1.45-1.60	6-20	0.02-0.04	0.0-2.9	0.2-1.0	.02	.15					
	19-32	8-18	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.2-0.8	.05	.24					
	32-61	4-18	1.45-1.60	6-20	0.04-0.06	0.0-2.9	0.2-0.8	.02	.20					
	61-69	8-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.2-0.8	.15	.24					
Barx-----	0-6	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.24	.24	5	3	86	5c	---
	6-11	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.32	.32					
	11-24	27-35	1.25-1.40	0.2-0.6	0.16-0.18	3.0-5.9	0.5-1.5	.24	.32					
	24-41	18-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.2-0.8	.24	.32					
	41-60	18-27	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.2-0.8	.17	.32					
5133: Menefee-----	0-3	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.5-3.0	.37	.37	1	6	48	7s	---
	3-10	18-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	1.0-2.0	.24	.32					
	10-20	---	---	0.0015-0.06	---	---	---	---	---					
Kaiparowits Formation Badland--	0-1	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---
	1-60	---	---	0.0000-0.2	---	---	---	---	---	---				

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5136: Suzmayne-----	0-7	18-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	0.5-1.0	.20	.37	2	5	56	6s	---	
	7-13	18-27	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.2-0.8	.17	.32						
	13-27	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.2-0.8	.10	.32						
	27-37	---	---	0.0015-0.06	---	---	---	---	---						
Colskel-----	0-6	18-26	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	1.5-3.0	.10	.37	1	8	0	7s	---	
	6-17	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.8-1.5	.10	.32						
	17-27	---	---	0.0015-0.06	---	---	---	---	---						
Straight Cliffs Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5137: Casmos family-----	0-3	20-25	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.5-1.0	.10	.37	1	7	38	7s	---	
	3-10	20-25	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	0.2-0.8	.17	.32						
	10-13	20-25	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.2-0.8	.10	.32						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
Pariette family-----	0-3	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.28	.28	3	3	86	6s	---	
	3-9	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.0	.32	.32						
	9-15	18-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.2-0.8	.24	.32						
	15-29	18-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.2-0.8	.24	.32						
	29-38	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.2-0.8	.10	.32						
	38-48	---	---	0.2-0.6	---	---	---	---	---						
Dakota and Morrison Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5138: Nakai-----	0-3	2-15	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15	5	1	220	5s	---	
	3-21	2-15	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15						
	21-31	8-18	1.35-1.50	2-6	0.12-0.15	0.0-2.9	0.5-1.5	.24	.24						
	31-63	8-18	1.35-1.50	2-6	0.12-0.15	0.0-2.9	0.5-1.5	.24	.24						
	63-79	2-18	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.0-1.0	.15	.15						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5138: Sheppard-----	0-3	1-10	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15	5	1	250	5c	---	
	3-44	1-10	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-1.0	.15	.15						
	44-61	1-10	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15						
	61-79	1-10	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.5	.15	.15						
5139: Hetz-----	0-1	---	---	---	---	---	---	---	---	5	3	86	6w	---	
	1-8	---	---	---	---	---	---	---	---						
	8-13	15-20	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.5-3.0	.24	.24						
	13-17	18-27	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.20	.20						
	17-26	28-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.0	.24	.24						
	26-52	28-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.0	.24	.24						
	52-71	28-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.0	.24	.24						
5140: Green River-----	0-7	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5e	---	
	7-14	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.24	.24						
	14-29	5-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.0	.15	.15						
	29-37	5-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.0	.15	.15						
	37-41	8-18	1.35-1.50	2-6	0.11-0.13	3.0-5.9	0.5-1.0	.24	.24						
	41-48	5-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.0	.15	.15						
	48-63	5-18	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.0-0.0	.10	.15						
Radnik, moist-----	0-3	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.37	.37	5	4L	86	5c	---	
	3-9	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.24	.24						
	9-19	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.20	.24						
	19-30	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.0	.15	.15						
	30-36	8-18	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	0.0-0.0	.32	.32						
	36-44	0-8	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.43	.43						
	44-50	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.24	.24						
	50-59	0-8	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.0-0.0	.15	.15						
	59-79	18-27	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	0.0-0.0	.32	.32						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5140: Suwane, saline----	0-2	7-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.37	.37	5	5	56	5c	---	
	2-9	7-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.24	.24						
	9-11	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.0	.24	.24						
	11-22	7-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.20	.24						
	22-28	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.24	.24						
	28-38	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.0	.32	.32						
	38-50	7-20	1.35-1.50	2-6	0.15-0.17	3.0-5.9	0.0-0.0	.32	.43						
	50-54	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.0	.24	.32						
	54-63	7-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.0	.24	.24						
5141: Radnik, moist-----	0-2	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-3.0	.28	.28	5	4L	86	5c	---	
	2-5	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-3.0	.24	.24						
	5-8	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-3.0	.24	.24						
	8-11	8-18	1.35-1.50	2-6	0.15-0.17	0.0-2.9	0.5-2.0	.43	.43						
	11-19	0-8	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-1.5	.15	.15						
	19-45	8-18	1.25-1.40	2-6	0.16-0.18	0.0-2.9	0.5-2.0	.24	.24						
	45-60	0-8	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15						
Escavada-----	0-16	1-10	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	5	3	86	5c	---	
	16-29	1-10	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.5-1.5	.15	.15						
	29-37	1-10	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.5-1.5	.15	.15						
	37-60	1-10	1.45-1.60	20-100	0.05-0.07	0.0-2.9	0.5-2.0	.02	.02						
Suwanee, saline----	0-8	7-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.37	.37	5	5	56	5c	---	
	8-16	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.0	.32	.32						
	16-37	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						
	37-39	18-27	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	0.2-0.8	.32	.32						
	39-45	7-20	1.35-1.50	2-6	0.15-0.17	0.0-2.9	0.2-0.8	.43	.43						
	45-48	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						
	48-57	7-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-0.8	.24	.24						
	57-79	1-15	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.8	.20	.20						
5142: Alvey-----	0-2	18-35	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.24	.24	5	3	86	5c	---	
	2-11	18-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.5	.24	.24						
	11-35	18-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.2-0.8	.32	.32						
	35-50	18-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.2-0.8	.32	.32						
	50-60	18-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.2-0.8	.32	.32						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi-	erodi-	NIRR	IRR
											bility	bility		
In	Pct	g/cc	In/hr	In/in	Pct	Pct				group	index			
5142: Atrac-----	0-19	10-27	1.35-1.50	2-6	0.15-0.17	0.0-2.9	1.0-2.0	.43	.43	5	3	86	5c	---
	19-29	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.32	.32					
	29-60	10-27	1.35-1.50	2-6	0.15-0.17	0.0-2.9	0.2-0.8	.37	.37					
5143: Elias-----	0-2	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---
	2-6	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	1.0-2.0	.32	.32					
	6-11	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.32	.32					
	11-13	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24					
	13-32	8-18	1.35-1.50	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.43	.43					
	32-34	18-27	1.35-1.50	2-6	0.14-0.16	3.0-5.9	0.5-1.0	.28	.28					
	34-63	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-0.8	.24	.24					
Mikim-----	0-4	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---
	4-7	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24					
	7-15	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32					
	15-25	8-18	1.35-1.50	2-6	0.15-0.17	0.0-2.9	0.2-0.8	.43	.43					
	25-28	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32					
	28-33	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-0.8	.24	.24					
	33-42	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32					
	42-63	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-0.8	.24	.24					
5144: Tsaya-----	0-2	18-27	1.25-1.40	2-6	0.07-0.09	3.0-5.9	0.5-1.0	.10	.37	1	8	0	7s	---
	2-8	18-27	1.25-1.40	2-6	0.09-0.11	3.0-5.9	0.2-0.8	.17	.32					
	8-13	18-27	1.25-1.40	2-6	0.07-0.09	3.0-5.9	0.2-0.8	.10	.32					
	13-23	---	---	0.0015-0.06	---	---	---	---	---					
Straight Cliffs Formation Burnt Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---
5146: Moffat-----	0-4	8-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.24	.24	5	2	134	5c	---
	4-13	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24					
	13-36	8-20	1.35-1.50	2-6	0.10-0.12	3.0-5.9	0.2-1.0	.15	.20					
	36-60	8-20	1.35-1.50	2-6	0.09-0.11	3.0-5.9	0.2-0.5	.15	.20					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5146:															
Pagina-----	0-6	8-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.24	.24	3	2	134	6s	---	
	6-17	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24						
	17-35	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-0.8	.24	.24						
	35-45	---	---	0.2-0.6	---	---	---	---	---						
Sheppard-----	0-1	3-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15	5	1	250	5c	---	
	1-60	3-8	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.2-0.8	.15	.15						
5149:															
Tsaya, saline-----	0-1	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	0.5-1.0	.10	.37	1	8	0	7s	---	
	1-2	18-27	1.25-1.40	2-6	0.08-0.10	3.0-5.9	0.2-0.8	.10	.32						
	2-6	18-27	1.25-1.40	2-6	0.07-0.09	3.0-5.9	0.2-0.8	.10	.32						
	6-16	---	---	0.0015-0.06	---	---	---	---	---						
Straight Cliffs Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
Lithic Torriorthents	0-1	10-20	1.35-1.50	2-6	0.10-0.12	3.0-5.9	0.5-1.0	.24	.24	1	4L	86	7s	---	
	1-9	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.2-0.8	.32	.32						
	9-14	---	---	0.2-0.6	---	---	---	---	---						
	14-24	---	---	0.0015-0.06	---	---	---	---	---						
5150:															
Chipeta-----	0-3	35-39	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	0.2-0.8	.37	.37	2	4	86	6s	---	
	3-11	35-39	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	0.2-0.8	.32	.32						
	11-21	---	---	0.06-0.2	---	---	---	---	---						
Hanksville-----	0-3	27-35	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	0.2-0.8	.32	.37	3	4L	86	6s	---	
	3-17	35-55	1.15-1.30	0.06-0.2	0.17-0.19	6.0-8.9	0.2-0.8	.32	.32						
	17-31	35-55	1.15-1.30	0.06-0.2	0.17-0.19	6.0-8.9	0.0-0.0	.24	.32						
	31-38	35-55	1.15-1.30	0.06-0.2	0.15-0.17	6.0-8.9	0.0-0.0	.17	.32						
	38-48	---	---	0.06-0.2	---	---	---	---	---						
Tropic Formation Shale Badland-----	0-1	---	---	0.06-0.2	---	---	---	---	---	---	8	0	8	---	
	1-60	---	---	0.0000-0.2	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5151: Pinepoint, dry-----	0-8	1-5	1.45-1.60	20-100	0.07-0.09	0.0-2.9	1.5-3.0	.15	.15	5	2	134	7s	---	
	8-28	1-5	1.45-1.60	20-100	0.07-0.09	0.0-2.9	1.2-2.8	.15	.15						
	28-54	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15						
	54-60	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15						
Tenneycanyon-----	0-3	1-10	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.5-3.0	.15	.15	4	1	220	5c	---	
	3-15	1-10	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.9-2.4	.15	.15						
	15-29	1-10	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.9-2.4	.10	.15						
	29-52	1-10	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.3-1.9	.15	.15						
	52-60	1-10	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.3-1.9	.10	.15						
	60-65	1-10	1.45-1.60	20-100	0.04-0.06	0.0-2.9	0.0-1.3	.10	.15						
	65-74	---	---	0.0015-0.06	---	---	---	---	---						
Parkwash-----	0-2	1-6	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15	1	2	134	7s	---	
	2-6	1-5	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15						
	6-15	1-5	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15						
	15-25	---	---	0.0015-0.06	---	---	---	---	---						
5154: Dient-----	0-6	18-27	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.20	.28	5	6	48	5c	---	
	6-24	18-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.5-1.0	.20	.24						
	24-60	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.2-1.0	.02	.24						
Crotoncanyon-----	0-2	27-40	1.25-1.40	0.2-0.6	0.12-0.14	3.0-5.9	0.5-1.0	.20	.37	1	5	56	7s	---	
	2-11	27-40	1.25-1.40	0.2-0.6	0.09-0.11	3.0-5.9	0.2-0.8	.10	.32						
	11-20	---	---	0.0015-0.06	---	---	---	---	---						
5155: Sanostee, warm-----	0-4	7-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	2	3	86	5s	---	
	4-9	7-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24						
	9-18	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-2.0	.24	.24						
	18-26	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-2.0	.24	.24						
	26-30	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-2.0	.32	.32						
	30-35	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.5	.32	.32						
	35-45	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5155:															
Milok-----	0-5	0-8	1.45-1.60	20-100	0.08-0.10	0.0-2.9	1.0-2.0	.17	.17	5	2	134	7c	---	
	5-28	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.8-1.8	.24	.24						
	28-49	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.24	.24						
	49-60	18-27	1.25-1.40	2-6	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						
Lazear, warm-----	0-4	7-18	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.15	.17	1	2	134	6s	---	
	4-6	7-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.15	.20						
	6-11	18-27	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.5-1.5	.05	.20						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						
5156:															
Daklos, steep-----	0-2	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	1.0-2.0	.10	.37	1	8	0	6s	---	
	2-8	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.0-0.0	.10	.32						
	8-14	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.0-0.0	.10	.32						
	14-24	---	---	0.0015-0.06	---	---	---	---	---						
Fourmilebench-----	0-2	5-18	1.45-1.60	6-20	0.02-0.04	0.0-2.9	1.0-2.0	.02	.17	1	4	86	6s	---	
	2-7	12-27	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.2-1.2	.05	.20						
	7-17	---	---	0.0015-0.06	---	---	---	---	---						
5157:															
Daklos family-----	0-3	12-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.0-2.0	.10	.37	1	3	86	6s	---	
	3-11	12-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	0.0-0.0	.10	.32						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						
Wahweap Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
5158:															
Mellenthin, moist---	0-3	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	1.0-2.0	.10	.37	1	8	0	6s	---	
	3-7	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.5	.10	.32						
	7-12	10-20	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.0	.05	.17						
	12-22	---	---	0.0015-0.06	---	---	---	---	---						
Timpoweap Member, Moenkopi Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
								In	Pct	g/cc	In/hr	In/in	Pct	Pct	
5159:															
Mellenthin, moist---	0-4	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	1.0-2.0	.10	.37	1	8	0	6s	---	
	4-10	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.5	.10	.32						
	10-20	---	---	0.0015-0.06	---	---	---	---	---						
Bowdish-----	0-4	7-35	1.25-1.40	0.6-2	0.09-0.11	0.0-2.9	1.0-2.0	.10	.37	2	4L	86	6s	---	
	4-7	18-35	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.5	.24	.32						
	7-15	18-35	1.15-1.30	0.2-0.6	0.15-0.17	3.0-5.9	0.2-1.2	.32	.37						
	15-21	18-35	1.15-1.30	0.2-0.6	0.12-0.14	3.0-5.9	0.0-1.0	.20	.37						
	21-31	---	---	0.0015-0.06	---	---	---	---	---						
5160:															
Timpoweap-----	0-5	8-18	1.25-1.40	2-6	0.07-0.09	0.0-2.9	1.0-2.0	.15	.28	1	6	48	7s	---	
	5-13	27-35	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	0.0-1.0	.10	.32						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
Evpark-----	0-5	8-18	1.35-1.50	2-6	0.14-0.16	0.0-2.9	1.0-2.0	.43	.55	2	3	86	6s	---	
	5-10	8-18	1.25-1.40	0.6-2	0.15-0.17	0.0-2.9	0.5-1.0	.32	.32						
	10-18	8-18	1.35-1.50	2-6	0.12-0.14	0.0-2.9	0.2-0.8	.32	.43						
	18-27	18-35	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						
	27-33	18-35	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	0.0-0.5	.17	.32						
	33-43	---	---	0.0015-0.06	---	---	---	---	---						
Atarque-----	0-4	6-18	1.25-1.40	2-6	0.12-0.14	0.0-2.9	1.0-2.0	.43	.55	1	6	48	7s	---	
	4-8	18-28	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.5-1.0	.32	.32						
	8-18	18-28	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.2-0.8	.20	.24						
	18-28	---	---	0.0015-0.06	---	---	---	---	---						
5163:															
Horsemountain, moist	0-4	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.20	.28	2	3	86	7s	---	
	4-11	18-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.5	.24	.32						
	11-19	18-35	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.5	.24	.32						
	>19	---	---	---	---	---	---	---	---						
5164:															
Chinle Formation															
Badland-----	0-1	---	---	0.06-0.2	---	---	---	---	---		8	0	8	---	
	1-60	---	---	0.0000-0.2	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodibility group	erodibility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5166:															
Hillburn, dry-----	0-2	7-27	1.35-1.50	2-6	0.06-0.08	0.0-2.9	1.0-2.0	.05	.28	1	8	0	6s	---	
	2-4	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.5	.10	.32						
	4-14	---	---	0.0015-0.06	---	---	---	---	---						
Sazi, moist-----	0-4	2-15	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.0-2.0	.24	.24	2	3	86	6s	---	
	4-7	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	7-24	10-18	1.35-1.45	2-6	0.09-0.11	0.0-2.9	0.2-0.8	.20	.24						
	24-34	---	---	0.0015-0.06	---	---	---	---	---						
5167:															
Progresso, cool-----	0-2	8-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.15	.24	2	4	86	6s	---	
	2-14	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.15	.20						
	14-24	18-27	1.35-1.50	2-6	0.10-0.12	3.0-5.9	0.5-1.0	.15	.20						
	24-26	18-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.5-1.0	.20	.24						
	26-36	---	---	0.0015-0.06	---	---	---	---	---						
Atchee family-----	0-2	8-20	1.45-1.60	6-20	0.04-0.06	0.0-2.9	1.0-2.0	.10	.17	1	3	86	6s	---	
	2-8	18-21	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	1.0-2.0	.15	.24						
	8-18	---	---	0.0015-0.6	---	---	---	---	---						
	18-35	---	---	0.0015-0.06	---	---	---	---	---						
5169:															
Lazear, steep-----	0-4	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	1.0-2.0	.10	.37	1	8	0	6s	---	
	4-11	18-27	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	0.5-1.5	.24	.32						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						
Simel-----	0-3	18-20	1.35-1.50	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.15	.28	1	3	86	6s	---	
	3-8	20-27	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	0.5-1.5	.24	.32						
	8-11	20-35	1.25-1.40	2-6	0.07-0.09	3.0-5.9	0.2-0.8	.05	.24						
	11-14	---	---	0.06-0.2	---	---	---	---	---						
	14-24	---	---	0.0015-0.06	---	---	---	---	---						
Carmel Formation Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5170:															
Lemrac-----	0-3	5-18	1.15-1.30	0.2-0.6	0.16-0.18	0.0-2.9	1.0-2.0	.43	.43	3	4L	86	5s	---	
	3-9	5-18	1.25-1.40	0.6-2	0.15-0.17	0.0-2.9	0.0-0.5	.24	.32						
	9-22	5-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.0-0.5	.10	.20						
	22-32	---	---	0.0015-0.06	---	---	---	---	---						
Simel-----	0-3	18-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.32	.37	1	3	86	6s	---	
	3-10	18-27	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	0.5-1.5	.17	.32						
	10-15	---	---	0.06-0.2	---	---	---	---	---						
	15-25	---	---	0.0015-0.06	---	---	---	---	---						
Humbug, moist-----	0-3	6-18	1.35-1.50	2-6	0.15-0.17	0.0-2.9	1.0-2.0	.55	.55	4	3	86	5c	---	
	3-5	8-20	1.35-1.50	2-6	0.15-0.17	3.0-5.9	1.0-2.0	.43	.43						
	5-15	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24						
	15-17	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.20	.24						
	17-22	6-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.2-0.8	.20	.24						
	22-44	6-18	1.35-1.50	2-6	0.08-0.10	0.0-2.9	0.2-0.8	.15	.24						
	44-49	5-18	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.2-0.8	.15	.24						
	49-59	---	---	0.2-0.6	---	---	---	---	---						
5171:															
Kenzo-----	0-4	18-27	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	1.0-2.0	.32	.37	1	6	48	7s	---	
	4-13	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-1.0	.32	.32						
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
Retsabal-----	0-1	8-18	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	0.5-1.5	.37	.37	2	3	86	7s	---	
	1-11	10-22	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						
	11-21	---	---	0.06-0.2	---	---	---	---	---						
Progresso, cool-----	0-6	18-27	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.37	.37	2	3	86	6s	---	
	6-13	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-1.0	.32	.32						
	13-22	18-27	1.25-1.40	0.6-2	0.15-0.17	3.0-5.9	0.5-1.0	.24	.32						
	22-29	8-18	1.35-1.50	2-6	0.16-0.18	0.0-2.9	0.0-0.0	.20	.20						
	29-39	---	---	0.0015-0.06	---	---	---	---	---						
5172:															
Ruinpoint-----	0-2	18-27	1.15-1.30	0.2-0.6	0.17-0.19	3.0-5.9	1.0-2.0	.43	.43	5	4L	86	5c	---	
	2-10	18-27	1.15-1.30	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.5	.37	.37						
	10-25	18-27	1.15-1.30	0.2-0.6	0.17-0.19	3.0-5.9	0.2-0.8	.37	.37						
	25-60	18-27	1.15-1.30	0.2-0.6	0.17-0.19	3.0-5.9	0.2-0.8	.37	.37						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5172: Barx-----	0-2	18-27	1.35-1.50	2-6	0.11-0.13	3.0-5.9	1.0-2.0	.24	.24	5	3	86	5c	---	
	2-8	18-27	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-2.0	.28	.28						
	8-17	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.5	.28	.28						
	17-30	18-27	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.20	.20						
	30-42	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.20	.20						
	42-61	18-27	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.2-0.8	.20	.20						
5173: Simel-----	0-2	18-27	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	1.0-2.0	.20	.37	1	3	86	6s	---	
	2-6	27-35	1.15-1.30	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.5	.24	.32						
	6-8	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	0.2-0.8	.10	.32						
	8-10	---	---	0.06-0.2	---	---	---	---	---						
	10-20	---	---	0.0015-0.06	---	---	---	---	---						
Strych, moist-----	0-3	8-20	1.35-1.50	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.20	.28	4	4L	86	5c	---	
	3-5	8-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.5	.24	.32						
	5-8	8-27	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	0.5-1.5	.17	.32						
	8-25	8-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.2-0.8	.15	.24						
	25-39	8-20	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.2-0.8	.05	.20						
	39-60	8-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	0.2-0.8	.15	.24						
Kenzo-----	0-2	8-18	1.25-1.40	0.6-2	0.13-0.15	0.0-2.9	1.0-2.0	.32	.37	1	6	48	7s	---	
	2-7	8-18	1.25-1.40	0.6-2	0.12-0.14	0.0-2.9	0.2-1.0	.17	.32						
	7-17	---	---	0.0015-0.06	---	---	---	---	---						
5174: Strych-----	0-5	8-20	1.35-1.50	2-6	0.05-0.07	0.0-2.9	1.0-2.0	.15	.28	4	4L	86	5c	---	
	5-11	8-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.8-1.2	.10	.32						
	11-18	8-20	1.35-1.50	2-6	0.06-0.08	0.0-2.9	0.2-0.8	.05	.24						
	18-60	8-20	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.2-0.8	.05	.20						
Sazi, moist-----	0-10	2-10	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.28	.28	2	3	86	6s	---	
	10-21	10-18	1.35-1.45	2-6	0.10-0.12	0.0-2.9	0.5-1.5	.24	.24						
	21-29	5-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.8	.15	.15						
	29-37	5-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.2-0.8	.15	.15						
	37-46	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5180:															
Pinepoint-----	0-6	1-5	1.45-1.60	20-100	0.07-0.09	0.0-2.9	1.2-2.8	.15	.15	3	2	134	7s	---	
	6-19	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15						
	19-30	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15						
	30-40	---	---	0.0015-0.06	---	---	---	---	---						
Navajo Sandstone Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---	---	8	0	8	---	
Parkwash-----	0-2	1-6	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15	1	2	134	7s	---	
	2-10	1-5	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15						
	10-19	1-5	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15						
	19-29	---	---	0.0015-0.06	---	---	---	---	---						
5181:															
Parkelei-----	0-3	2-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.5-3.0	.28	.28	5	3	86	6c	---	
	3-7	2-20	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24						
	7-13	20-27	1.25-1.45	0.6-2	0.17-0.19	3.0-5.9	1.0-2.0	.24	.24						
	13-30	20-27	1.25-1.45	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.24	.24						
	30-34	27-35	1.25-1.45	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.0	.32	.32						
	34-44	20-27	1.25-1.45	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						
	44-61	20-27	1.25-1.45	0.6-2	0.16-0.18	3.0-5.9	0.2-0.8	.32	.32						
Plumasano, moist----	0-4	5-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.5-3.0	.17	.17	5	2	134	6c	---	
	4-19	5-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24						
	19-43	5-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15						
	43-61	4-18	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.2-0.8	.15	.15						
Pinepoint-----	0-6	1-9	1.45-1.60	20-100	0.07-0.09	0.0-2.9	1.5-3.0	.15	.15	5	1	250	7s	---	
	6-17	1-5	1.45-1.60	20-100	0.07-0.09	0.0-2.9	1.2-2.8	.15	.15						
	17-29	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15						
	29-42	1-5	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15						
	42-60	1-9	1.45-1.60	20-100	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15						
5182:															
Arabrab-----	0-5	5-18	1.45-1.60	6-20	0.08-0.10	0.0-2.9	1.5-3.0	.17	.17	1	2	134	7s	---	
	5-12	18-27	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	0.5-2.0	.24	.32						
	12-22	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5182:															
Colskel-----	0-4	18-20	1.35-1.50	2-6	0.03-0.05	0.0-2.9	1.5-3.0	.02	.24	1	8	0	7s	---	
	4-11	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-1.0	.05	.32						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						
Carmel Formation															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---		8	0	8	---	
5183:															
Navajo Sandstone															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---		8	0	8	---	
Parkwash-----	0-13	1-6	1.45-1.60	20-100	0.04-0.10	0.0-2.9	1.5-3.0	.15	.15	1	2	134	7s	---	
	13-23	---	---	0.0015-0.06	---	---	---	---	---						
Vessilla-----	0-2	8-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.5-3.0	.20	.37	1	8	0	6s	---	
	2-6	8-27	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.17	.32						
	6-11	---	---	0.0015-0.06	---	---	---	---	---						
	11-21	---	---	0.0015-0.06	---	---	---	---	---						
5185:															
Nomrah-----	0-3	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.5-3.0	.37	.37	5	4L	86	5c	---	
	3-6	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32						
	6-11	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32						
	11-18	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.8-1.8	.32	.32						
	18-36	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.8-1.8	.32	.32						
	36-47	18-27	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	0.5-1.0	.24	.32						
	47-63	5-20	1.35-1.50	2-6	0.09-0.11	3.0-5.9	0.5-1.0	.20	.24						
Upler-----	0-3	5-20	1.35-1.50	2-6	0.06-0.08	0.0-2.9	1.5-3.0	.05	.24	5	7	38	6c	---	
	3-9	8-27	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	1.0-2.0	.17	.32						
	9-25	7-20	1.35-1.50	2-6	0.05-0.07	0.0-2.9	0.8-1.8	.05	.20						
	25-35	5-15	1.45-1.60	6-20	0.02-0.04	0.0-2.9	0.5-1.0	.05	.15						
	35-60	8-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.2-0.8	.10	.32						
5186:															
Bodot, cool-----	0-2	40-60	1.15-1.30	0.0015-0.06	0.17-0.19	6.0-8.9	1.5-3.0	.32	.32	3	4	86	6s	---	
	2-33	40-60	1.15-1.30	0.0015-0.06	0.17-0.19	6.0-8.9	0.5-1.0	.28	.28						
	33-43	---	---	0.0015-0.06	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5186: Sili-----	0-2	27-40	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	1.5-3.0	.32	.37	5	4L	86	4c	3e	
	2-5	27-40	1.15-1.30	0.06-0.2	0.17-0.19	6.0-8.9	1.0-2.0	.24	.32						
	5-28	27-40	1.25-1.40	0.2-0.6	0.17-0.19	6.0-8.9	0.5-1.5	.24	.32						
	28-60	27-40	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.0-0.5	.24	.32						
5187: Zigzag-----	0-3	27-40	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	1.5-3.0	.32	.37	2	4	86	7s	---	
	3-9	40-55	1.15-1.30	0.06-0.2	0.17-0.19	6.0-8.9	1.2-2.8	.20	.28						
	9-14	40-55	1.15-1.30	0.06-0.2	0.17-0.19	6.0-8.9	1.0-2.0	.20	.28						
	14-30	---	---	0.06-0.2	---	---	---	---	---						
	30-40	---	---	0.06-0.2	---	---	---	---	---						
Aridic Ustorthents--	0-4	18-27	1.25-1.40	0.6-2	0.09-0.11	3.0-5.9	1.5-3.0	.10	.37	3	8	0	6s	---	
	4-11	17-35	1.25-1.40	0.2-0.6	0.11-0.13	3.0-5.9	1.0-2.0	.10	.32						
	11-22	27-35	1.25-1.40	0.2-0.6	0.10-0.12	3.0-5.9	0.5-1.0	.10	.32						
	22-32	---	---	0.0015-0.06	---	---	---	---	---						
5188: Frandsen-----	0-4	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.32	.37	5	4L	86	6e	---	
	4-12	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.24	.32						
	12-44	18-27	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	0.0-1.0	.24	.32						
	44-60	18-27	1.15-1.30	0.2-0.6	0.17-0.19	3.0-5.9	0.0-1.0	.32	.37						
5189: Widtsøe-----	0-10	10-20	1.35-1.50	2-6	0.07-0.09	0.0-2.9	1.5-3.0	.15	.24	2	8	0	6e	---	
	10-20	20-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.5-2.0	.05	.32						
	20-52	8-15	1.45-1.60	6-20	0.02-0.04	0.0-2.9	0.5-2.0	.05	.15						
	52-63	8-15	1.45-1.60	6-20	0.04-0.06	0.0-2.9	0.0-1.0	.05	.15						
Emlin-----	0-3	18-27	1.25-1.40	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.37	.37	5	5	56	6e	---	
	3-8	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32						
	8-21	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.5-2.0	.24	.32						
	21-35	18-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.0-1.0	.32	.32						
	35-46	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-1.0	.32	.32						
	46-60	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	0.0-1.0	.32	.32						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5190:															
Podo-----	0-2	8-18	1.35-1.40	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.20	.24	1	8	0	7s	---	
	2-10	8-18	1.30-1.40	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.15	.20						
	10-20	---	---	0.0015-0.06	---	---	---	---	---						
Straight Cliffs and Wahweap Formation															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---		8	0	8	---	
5191:															
Ruko-----	0-4	27-40	1.20-1.25	0.2-0.6	0.17-0.19	3.0-5.9	1.0-2.0	.32	.32	2	4L	86	7s	---	
	4-7	40-50	1.20-1.25	0.06-0.2	0.17-0.19	6.0-8.9	0.0-1.0	.24	.24						
	7-19	40-50	1.20-1.25	0.06-0.2	0.17-0.19	6.0-8.9	0.0-1.0	.24	.24						
	19-29	---	---	0.06-0.2	---	---	---	---	---						
Straight Cliffs and Wahweap Formation															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---		8	0	8	---	
Podo-----	0-4	8-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.20	.24	1	8	0	7s	---	
	4-17	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	0.5-1.0	.15	.20						
	17-27	---	---	0.0015-0.06	---	---	---	---	---						
5192:															
Gerst family-----	0-3	18-27	1.25-1.30	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.28	.28	2	4L	86	7s	---	
	3-12	18-27	1.25-1.30	0.6-2	0.17-0.19	3.0-5.9	0.0-1.0	.28	.28						
	12-22	---	---	0.06-0.2	---	---	---	---	---						
Cannonville-----	0-7	40-50	1.15-1.25	0.06-0.2	0.17-0.18	6.0-8.9	0.0-0.5	.28	.28	1	4	86	7s	---	
	7-17	---	---	0.06-0.2	---	---	---	---	---						
Straight Cliffs and Dakota Formation															
Rock outcrop-----	0-60	---	---	0.0015-0.06	---	---	---	---	---		8	0	8	---	
5193:															
Kaiparowits															
Formation Badland--	0-1	---	---	0.06-0.2	---	---	---	---	---		8	0	8	---	
	1-60	---	---	0.0000-0.2	---	---	---	---	---						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi-	erodi-	NIRR	IRR
											bility	bility		
In	Pct	g/cc	In/hr	In/in	Pct	Pct				group	index			
5195:														
Henrieville-----	0-5	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.5-3.0	.20	.24	4	3	86	6e	3e
	5-13	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.15	.20					
	13-24	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.15	.20					
	24-41	8-18	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.8-1.5	.10	.15					
	41-61	8-18	1.45-1.60	6-20	0.07-0.09	0.0-2.9	0.8-1.5	.10	.15					
	61-69	5-18	1.45-1.60	20-100	0.05-0.07	0.0-2.9	0.5-1.0	.10	.15					
	>69	4-18	1.45-1.60	20-100	0.05-0.07	0.0-2.9	0.0-0.8	.10	.10					
5198:														
Bigpack-----	0-2	27-35	1.25-1.40	0.2-0.6	0.17-0.19	3.0-5.9	1.0-2.0	.32	.37	5	4L	86	7e	---
	2-12	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.8-1.5	.24	.32					
	12-28	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.2-1.0	.24	.32					
	28-60	18-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.2-1.0	.24	.32					
5199:														
Quagmeier-----	0-6	8-18	1.35-1.50	2-6	0.06-0.08	0.0-2.9	1.5-3.0	.05	.24	3	8	0	4s	---
	6-12	27-35	1.25-1.40	0.2-0.6	0.11-0.13	3.0-5.9	1.0-2.0	.10	.32					
	12-23	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.8-1.5	.10	.32					
	23-30	18-27	1.25-1.40	0.6-2	0.07-0.09	3.0-5.9	0.8-1.5	.10	.32					
	30-60	18-27	1.45-1.60	0.6-2	0.02-0.04	3.0-5.9	0.8-1.5	.02	.15					
Parkelei-----	0-7	10-27	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.5-3.0	.20	.24	5	3	86	6c	---
	7-19	20-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.24	.32					
	19-36	20-35	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.8-1.5	.24	.32					
	36-60	20-35	1.15-1.30	0.6-2	0.17-0.19	3.0-5.9	0.8-1.5	.20	.24					
5200:														
Sojourn family-----	0-5	12-20	1.35-1.50	2-6	0.06-0.08	0.0-2.9	1.5-3.0	.15	.24	2	3	86	6s	---
	5-7	12-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.24	.32					
	7-15	12-27	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.24	.32					
	15-25	---	---	0.06-0.2	---	---	---	---	---					
Colskel-----	0-3	18-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.5-3.0	.10	.32	1	8	0	7s	---
	3-8	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-1.2	.10	.32					
	8-18	---	---	0.0015-0.06	---	---	---	---	---					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodibility group	erodibility index	NIRR	IRR
	In	Pct	g/cc	In/hr	In/in	Pct	Pct							
5200:														
Retsabal-----	0-2	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.5-3.0	.28	.28	2	3	86	7s	---
	2-11	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24					
	11-15	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24					
	15-25	---	---	0.06-0.2	---	---	---	---	---					
5201:														
Sojourn family-----	0-4	8-18	1.45-1.60	6-20	0.05-0.07	0.0-2.9	1.5-3.0	.10	.17	2	3	86	6s	---
	4-8	8-15	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.10	.15					
	8-10	8-18	1.45-1.60	6-20	0.04-0.06	0.0-2.9	0.5-1.0	.10	.15					
	10-20	---	---	0.06-0.2	---	---	---	---	---					
Aridic Ustorthents--	0-4	10-15	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.5-3.0	.10	.17	3	3	86	6s	---
	4-24	10-18	1.45-1.60	6-20	0.07-0.09	0.0-2.9	1.0-2.0	.10	.15					
	24-31	10-18	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-1.0	.10	.15					
	31-33	10-18	1.35-1.50	2-6	0.06-0.08	0.0-2.9	0.2-0.8	.15	.20					
	33-43	---	---	0.2-0.6	---	---	---	---	---					
5203:														
Wiggler-----	0-3	18-27	1.25-1.40	0.6-2	0.08-0.10	3.0-5.9	0.5-2.0	.10	.37	2	8	0	7s	---
	3-14	18-27	1.25-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.6	.24	.32					
	14-24	---	---	0.06-0.2	---	---	---	---	---					
Curecanti family, cool-----	0-0	---	---	---	---	---	---	---	---	3	8	0	5c	---
	0-8	18-35	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	1.5-3.0	.10	.37					
	8-19	18-35	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	1.5-3.0	.17	.32					
	19-28	18-35	1.25-1.40	0.2-0.6	0.10-0.12	3.0-5.9	1.0-2.0	.10	.32					
	28-35	18-35	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.17	.32					
	35-45	---	---	0.0015-0.06	---	---	---	---	---					
5205:														
Curecanti family----	0-1	---	---	---	---	---	---	---	---	3	8	0	5c	---
	1-7	18-35	1.25-1.40	2-6	0.10-0.12	3.0-5.9	1.5-3.0	.10	.37					
	7-17	18-35	1.25-1.40	0.6-2	0.12-0.14	3.0-5.9	1.5-3.0	.10	.32					
	17-60	18-35	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	1.0-2.0	.10	.32					

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class		
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct								
5205: Curecanti family, cool-----	0-8	18-35	1.25-1.40	2-6	0.09-0.11	3.0-5.9	1.5-3.0	.10	.37	3	8	0	5c	---	
	8-19	18-35	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	1.5-3.0	.10	.32						
	19-60	18-35	1.25-1.40	0.6-2	0.11-0.13	6.0-8.9	1.0-2.0	.10	.32						
Widtsoe-----	0-7	8-27	1.25-1.40	2-6	0.09-0.11	3.0-5.9	1.5-3.0	.10	.37	3	8	0	6e	---	
	7-12	27-40	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	0.5-2.0	.17	.32						
	12-23	27-40	1.25-1.40	0.6-2	0.11-0.13	6.0-8.9	0.5-2.0	.10	.32						
	23-63	27-40	1.25-1.40	2-6	0.09-0.11	3.0-5.9	0.0-1.0	.10	.32						
5206: Upler-----	0-8	8-27	1.25-1.40	0.6-2	0.09-0.11	0.0-2.9	1.5-3.0	.10	.37	5	7	38	6c	---	
	8-15	8-27	1.25-1.40	0.6-2	0.11-0.13	3.0-5.9	1.0-2.0	.17	.32						
	15-26	8-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	0.8-1.8	.17	.32						
	26-60	8-27	1.25-1.40	0.6-2	0.10-0.12	3.0-5.9	0.5-1.0	.10	.32						
5207: Winetti-----	0-6	15-27	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	2.0-4.0	.20	.37	3	8	0	6s	---	
	6-17	15-27	1.25-1.40	0.6-2	0.13-0.15	3.0-5.9	0.5-2.0	.17	.32						
	17-60	5-20	1.35-1.50	2-6	0.06-0.08	0.0-2.9	0.0-1.0	.05	.20						
Riverwash-----	---	---	---	---	---	---	---	---	---	---	---	---	8	---	
5210: Elpedro, moist-----	0-3	8-18	1.15-1.30	0.2-0.6	0.17-0.19	0.0-2.9	1.5-3.0	.32	.43	5	5	56	6e	---	
	3-9	8-18	1.15-1.30	0.2-0.6	0.17-0.19	0.0-2.9	1.5-3.0	.32	.37						
	9-20	8-18	1.15-1.30	0.2-0.6	0.17-0.19	0.0-2.9	1.0-2.0	.32	.37						
	20-46	20-27	1.15-1.30	0.2-0.6	0.17-0.19	3.0-5.9	1.0-3.0	.32	.37						
	46-63	27-35	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	1.0-2.0	.24	.32						
Flatnose-----	0-3	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.5-3.0	.20	.28	5	3	86	7s	---	
	3-8	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.2-2.8	.20	.24						
	8-15	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.4-3.0	.20	.24						
	15-19	8-18	1.35-1.50	2-6	0.10-0.12	0.0-2.9	1.0-2.0	.15	.20						
	19-35	8-18	1.35-1.50	6-20	0.15-0.17	0.0-2.9	1.3-2.9	.32	.43						
	35-60	27-35	1.15-1.30	0.06-0.2	0.17-0.19	3.0-5.9	1.0-2.8	.24	.32						

Table 7.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	Capability Class	
								Kw	Kf	T	erodi- bility group	erodi- bility index	NIRR	IRR
	In	Pct	g/cc	In/hr	In/in	Pct	Pct							
5211: Yarts, moist-----	0-5	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	5	3	86	5c	---
	5-46	10-18	1.35-1.50	2-6	0.15-0.17	0.0-2.9	0.2-1.0	.43	.43					
	46-60	11-18	1.35-1.50	2-6	0.12-0.14	0.0-2.9	0.2-1.0	.32	.43					
Sazi, moist-----	0-3	10-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.28	.28	2	2	134	6s	---
	3-5	10-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24					
	5-15	10-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.5-1.5	.24	.24					
	15-22	10-18	1.35-1.50	2-6	0.09-0.11	0.0-2.9	0.5-1.2	.15	.24					
	22-32	---	---	0.0015-0.06	---	---	---	---	---					

Table 8.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5001: Mido-----	0-3	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
	3-46	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
	46-60	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
5002: Dune Land-----	0-60	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
5003: Milok, cool-----	0-2	4.0-12	7.9-8.4	5-10	0	0.0-2.0	0
	2-8	5.0-12	7.9-8.4	5-12	0	0.0-2.0	0
	8-23	5.0-12	7.9-9.0	5-20	0	0.0-2.0	0
	23-38	5.0-12	7.9-9.0	10-25	0	0.0-2.0	0
	38-60	5.0-12	7.9-9.0	15-30	0	0.0-2.0	0
Barx, dry-----	0-2	5.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	2-9	5.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	9-19	5.0-15	7.9-8.4	1-7	0	0.0-2.0	0
	19-32	10-25	7.9-8.4	1-10	0	0.0-2.0	0
	32-56	10-25	8.5-9.0	10-15	0	0.0-2.0	0
	56-72	5.0-15	8.5-9.0	15-40	0	0.0-2.0	0
5004: Navajo Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
5006: Milok, cool-----	0-8	7.0-15	7.9-8.4	5-10	0	0.0-2.0	0
	8-18	5.0-15	7.9-8.4	5-12	0	0.0-2.0	0
	18-27	5.0-15	7.9-8.4	5-20	0	0.0-2.0	0
	27-60	5.0-15	7.9-8.4	10-25	0	0.0-2.0	0
5007: Navajo Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
Nalcase-----	0-4	2.0-10	6.6-7.3	0-2	0	0.0-2.0	0
	4-8	2.0-12	6.6-7.3	0-2	0	0.0-2.0	0
	>8	---	---	---	---	---	---
5008: Simel-----	0-2	5.5-16	7.9-8.4	15-30	0	0.0-2.0	0
	2-7	14-24	7.9-8.4	15-30	0	0.0-2.0	0
	7-12	---	---	---	---	---	---
	>12	---	---	---	---	---	---
Simel, steep-----	0-3	16-26	7.9-8.4	10-30	0	0.0-2.0	0
	3-8	---	---	---	---	---	---
	>8	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5009: Wayneco, dry-----	0-5	2.0-12	7.9-8.4	7-15	0	0.0-2.0	0
	5-19	5.0-15	7.9-8.4	15-30	0	0.0-2.0	0
	>19	---	---	---	---	---	---
5010: Retsabal-----	0-1	2.0-12	7.9-8.4	5-15	20-60	4.0-10.0	0
	1-3	1.0-11	7.9-8.4	5-15	40-80	4.0-10.0	0
	3-15	1.0-11	7.9-8.4	5-15	60-80	4.0-10.0	0
	>15	---	---	---	---	---	---
Lemrac-----	0-1	4.0-14	7.9-8.4	5-15	20-60	2.5-6.5	0-2
	1-19	0.0-5.0	7.9-8.4	1-5	40-80	0.4-4.4	0-2
	19-34	0.0-5.0	7.9-8.4	1-5	40-80	0.5-4.5	0-2
	>34	---	---	1-10	40-80	3.5-7.5	0-2
5011: Carmel Formation Badland-----	0-1	50-55	7.9-8.4	5-15	---	5.0-10.0	---
	1-60	---	---	---	---	---	---
Rizno, cool-----	0-3	8.0-18	7.9-8.4	5-15	0	0.0-2.0	0
	3-6	3.0-13	7.9-8.4	15-30	0	0.0-2.0	0
	6-9	3.0-13	7.9-8.4	15-30	0	0.0-2.0	0
	>9	---	---	---	---	---	---
Nonip-----	0-5	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	>5	---	---	---	---	---	---
5012: Santrick-----	0-4	1.3-11	6.6-7.3	0-2	0	0.0-2.0	0
	4-12	1.3-11	6.6-7.3	0-2	0	0.0-2.0	0
	12-22	0.5-10	6.6-7.3	0-2	0	0.0-2.0	0
	22-28	0.0-9.8	6.6-7.3	0-2	0	0.0-2.0	0
	>28	---	---	---	---	---	---
Nalcase-----	0-1	2.0-10	6.6-7.3	0-2	0	0.0-2.0	0
	1-6	2.0-12	6.6-7.3	0-2	0	0.0-2.0	0
	>6	---	---	---	---	---	---
Bispen-----	0-6	1.3-11	6.6-7.8	0-2	0	0.0-2.0	0
	6-51	0.5-10	6.6-7.8	0-2	0	0.0-2.0	0
	>51	---	---	---	---	---	---
5013: Mido-----	0-4	1.0-5.0	7.4-8.4	1-5	0	0.0-2.0	0
	4-60	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
Yarts-----	0-5	2.0-12	7.9-8.4	5-10	0	0.0-2.0	0
	5-60	3.0-13	7.9-8.4	5-10	0	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5015:							
Mespuñ-----	0-20	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	20-40	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	40-60	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
5017:							
Skos, dry-----	0-6	3.5-14	7.9-8.4	10-25	0	0.0-2.0	0
	6-13	8.0-18	7.9-8.4	10-25	0	0.0-2.0	0
	>13	---	---	---	---	---	---
Mido-----	0-15	1.0-5.0	7.4-7.8	1-5	0	0.0-2.0	0
	15-30	1.0-5.0	7.4-7.8	1-5	0	0.0-2.0	0
	30-45	1.0-5.0	7.4-7.8	1-5	0	0.0-2.0	0
	45-60	1.0-5.0	7.4-7.8	1-5	0	0.0-2.0	0
Arches, dry-----	0-4	1.3-11	7.4-8.4	0-8	0	0.0-2.0	0
	4-9	0.5-10	7.4-8.4	0-8	0	0.0-2.0	0
	>9	---	---	---	---	---	---
5018:							
Skos, dry-----	0-2	13-23	7.9-8.4	15-30	0	0.0-2.0	0
	2-4	12-22	7.9-8.4	15-30	0	0.0-2.0	0
	4-8	12-22	7.9-8.4	15-30	0	0.0-2.0	0
	>8	---	---	---	---	---	---
5019:							
Skos, dry-----	0-2	8.0-18	7.9-8.4	15-30	0	0.0-2.0	0
	2-8	7.5-18	7.9-8.4	15-30	0	0.0-2.0	0
	8-18	7.0-17	7.9-8.4	15-30	0	0.0-2.0	0
	>18	---	---	---	---	---	---
Page Sandstone, Carmel Formation Rock outcrop-----	0-60	---	---	---	---	---	---
Arches, dry-----	0-3	1.3-11	7.4-7.8	0-8	0	0.0-2.0	0
	3-10	1.3-11	7.4-8.4	0-8	0	0.0-2.0	0
	10-13	0.5-10	7.4-8.4	0-8	0	0.0-2.0	0
	>13	---	---	---	---	---	---
5020:							
Navajo Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
Mespuñ-----	0-5	1.0-5.0	6.6-7.3	0-2	0	0.0-2.0	0
	5-40	1.0-5.0	6.6-7.3	0-2	0	0.0-2.0	0
	40-60	1.0-5.0	6.6-7.3	0-2	0	0.0-2.0	0
Nalcas-----	0-10	2.0-10	6.6-7.3	0-2	0	0.0-2.0	0
	10-13	2.0-12	6.6-7.8	0-2	0	0.0-2.0	0
	>13	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5021:							
Milok, cool-----	0-8	7.0-15	7.9-8.4	5-10	0	0.0-2.0	0
	8-16	5.0-15	7.9-8.4	5-12	0	0.0-2.0	0
	16-30	5.0-15	7.9-8.4	5-20	0	0.0-2.0	0
	30-38	5.0-15	7.9-8.4	10-25	0	0.0-2.0	0
	38-60	5.0-15	7.9-8.4	10-25	0	0.0-2.0	0
Anasazi, cool-----	0-3	3.0-13	7.9-8.4	8-15	0	0.0-2.0	0
	3-10	4.0-14	7.9-8.4	8-17	0	0.0-2.0	0
	10-20	3.5-14	7.9-8.4	10-20	0	0.0-2.0	0
	20-30	1.5-12	7.9-8.4	20-30	0	0.0-2.0	0
	>30	---	---	---	---	---	---
5023:							
Tsaya-----	0-3	9.0-19	7.9-8.4	2-15	0	0.0-2.0	0
	3-6	8.0-18	7.9-8.4	2-15	0	0.0-2.0	0
	6-9	8.0-18	7.9-8.4	2-15	0	0.0-2.0	0
	>9	---	---	---	---	---	---
5025:							
Yarts-----	0-10	5.0-10	7.9-8.4	5-10	0	0.0-2.0	0
	10-60	5.0-10	7.9-8.4	5-10	0	0.0-2.0	0
5026:							
Entrada and Carmel Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5027:							
Tropic Formation Shale Badland-----	0-1	40-45	7.9-8.4	15-30	0-2	5.0-10.0	15-20
	1-60	---	---	---	---	---	---
Cannonville-----	0-7	20-30	7.9-9.0	15-30	0	4.0-8.0	0-5
	>7	---	---	---	---	---	---
Dakota Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5028:							
Cannonville Member, Entrada Formation Badland-----	0-1	---	---	---	---	---	---
	1-60	---	---	---	---	---	---
5029:							
Straight Cliffs Formation Rock outcrop-----	0-60	---	---	---	---	---	---
Atchee Family, steep-	0-3	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	3-12	3.0-8.0	7.9-8.4	5-15	0	0.0-2.0	0
	12-17	6.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	>17	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5029:							
Chilton Family-----	0-1	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	1-4	3.0-8.0	7.9-8.4	5-15	0	0.0-2.0	0
	4-39	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	>39	---	---	---	---	---	---
5030:							
Catahoula-----	0-5	5.0-15	7.9-8.4	8-15	0	0.0-2.0	0
	5-26	8.0-18	7.9-8.4	10-15	0	0.0-2.0	0
	26-49	8.0-18	7.9-8.4	10-15	0	0.0-2.0	0
	49-60	7.0-17	7.9-8.4	10-15	0	0.0-2.0	0
Clapper, dry-----	0-5	5.0-15	7.9-8.4	10-15	0	0.0-2.0	0
	5-13	8.0-18	7.9-8.4	10-15	0	0.0-2.0	0
	13-20	7.0-17	7.9-8.4	20-30	0	0.0-2.0	0
	20-38	7.0-17	7.9-8.4	20-30	0	0.0-2.0	0
	38-60	7.0-17	7.9-8.4	20-30	0	0.0-2.0	0
5031:							
Moclom-----	0-3	1.0-11	6.6-7.3	1-3	0	0.0-2.0	0
	3-10	1.0-11	6.6-7.3	1-3	0	0.0-2.0	0
	>10	---	---	---	---	---	---
Morrison Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5032:							
Remorris-----	0-3	14-24	7.9-8.4	10-20	0	0.0-2.0	0
	3-10	13-23	7.9-8.4	10-20	0	0.0-2.0	0
	10-15	12-22	7.9-8.4	10-20	0	0.0-2.0	0
	>15	---	---	---	---	---	---
Kenzo, steep-----	0-3	5.5-16	7.9-8.4	5-15	0	0.0-2.0	0
	3-8	5.5-16	7.9-8.4	5-15	0	0.0-2.0	0
	>8	---	---	---	---	---	---
Morrison and Entrada Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5033:							
Yarts, eroded-----	0-4	5.0-10	7.9-8.4	5-10	0	0.0-2.0	0
	4-22	5.0-10	7.9-8.4	5-10	0	0.0-2.0	0
	22-60	5.0-10	7.9-8.4	5-10	0	0.0-2.0	0
5034:							
Nonip-----	0-1	7.5-18	7.9-8.4	10-20	0	0.0-2.0	0
	1-5	9.5-20	7.9-8.4	15-30	0	0.0-2.0	0
	>5	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5035:							
Earlweed-----	0-4	1.0-5.0	7.9-8.4	5-10	0	0.0-2.0	0
	4-12	1.0-5.0	7.9-8.4	5-10	0	0.0-2.0	0
	12-24	1.0-5.0	7.9-8.4	5-15	0	0.0-2.0	0
	24-40	1.0-5.0	7.9-8.4	10-20	0	0.0-2.0	0
	40-60	1.0-5.0	7.9-8.4	10-20	0	0.0-2.0	0
Mido-----	0-1	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
	1-60	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
5037:							
Barx-----	0-5	6.0-18	7.4-7.8	1-5	0	0.0-2.0	0
	5-12	10-22	7.9-8.4	1-5	0	0.0-2.0	0
	12-31	5.0-15	7.9-8.4	1-10	0	0.0-2.0	0
	31-48	5.0-15	7.9-8.4	15-40	0	0.0-2.0	0
	48-60	5.0-15	7.9-8.4	10-20	0	0.0-2.0	0
5038:							
Mido-----	0-4	1.0-5.0	7.4-8.4	1-5	0	0.0-2.0	0
	4-60	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
Entrada Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
5040:							
Sazi-----	0-5	7.0-15	7.9-8.4	3-10	0	0.0-2.0	0
	5-20	5.0-15	7.9-8.4	3-12	0	0.0-2.0	0
	20-38	5.0-15	7.9-8.4	15-30	0	0.0-2.0	0
	>38	---	---	---	---	---	---
Milok, cool-----	0-4	7.0-15	7.9-8.4	5-10	0	0.0-2.0	0
	4-18	5.0-15	7.9-8.4	5-12	0	0.0-2.0	0
	18-32	5.0-15	7.9-8.4	5-20	0	0.0-2.0	0
	32-60	5.0-15	7.9-8.4	10-25	0	0.0-2.0	0
5041:							
Seeg, warm-----	0-3	0.5-10	7.9-8.4	5-10	0	0.0-2.0	0
	3-8	2.5-12	7.9-8.4	5-15	0	0.0-2.0	0
	8-15	2.5-12	8.5-9.0	15-30	0	0.0-2.0	0
	15-35	0.5-10	8.5-9.0	15-30	0	0.0-2.0	0
	35-60	0.0-10	7.9-8.4	10-20	0	0.0-2.0	0
Pagina-----	0-4	0.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	4-17	0.0-10	7.9-8.4	1-15	0	0.0-2.0	0
	17-25	0.0-10	8.5-9.0	15-30	0	0.0-2.0	0
	25-31	0.0-10	8.5-9.0	15-30	0	0.0-2.0	0
	31-33	---	---	---	---	---	---
5042:							
Moenkopie, warm-----	0-6	1.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	6-12	0.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	>12	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5042:							
Moepitz-----	0-3	1.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	3-8	1.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	8-28	4.0-14	7.9-8.4	5-15	0	0.0-2.0	0
	>28	---	---	---	---	---	---
Carmel Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5043:							
Daklos, steep-----	0-3	6.0-16	7.9-8.4	5-15	0	0.0-2.0	0
	3-13	5.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	>13	---	---	---	---	---	---
Morrison Formation and Romano Mesa Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
5044:							
Dient-----	0-4	7.0-17	7.9-8.4	5-15	0	0.0-4.0	0
	4-12	7.0-17	7.9-8.4	5-15	0	0.0-4.0	0
	12-60	6.0-16	7.9-8.4	5-15	0	0.0-4.0	0
5046:							
Moffat-----	0-5	1.0-11	7.9-8.4	5-10	0	0.0-2.0	0
	5-13	1.0-11	7.9-8.4	10-20	0	0.0-2.0	0
	13-29	2.0-12	7.9-8.4	15-25	0	0.0-2.0	0
	29-60	5.0-15	7.9-8.4	10-20	0	0.0-2.0	0
Sheppard-----	0-5	1.0-11	7.9-8.4	3-10	0	0.0-2.0	0
	5-35	0.0-10	7.9-8.4	3-10	0	0.0-2.0	0
	35-60	0.0-10	7.9-8.4	3-10	0	0.0-2.0	0
Nakai-----	0-3	7.0-11	7.4-8.4	5-10	0	0.0-2.0	0
	3-10	7.0-11	7.4-8.4	5-10	0	0.0-2.0	0
	10-20	8.0-12	7.4-8.4	5-10	0	0.0-2.0	0
	20-28	8.0-12	7.9-8.4	10-20	0	0.0-2.0	0
	28-42	8.0-12	7.9-8.4	10-25	0	0.0-2.0	0
	42-60	8.0-12	7.9-8.4	10-25	0	0.0-2.0	0
5047:							
Moffat-----	0-6	1.0-11	7.9-8.4	5-10	0	0.0-2.0	0
	6-17	4.0-14	7.9-8.4	5-10	0	0.0-2.0	0
	17-28	4.0-14	7.9-8.4	10-15	0	0.0-2.0	0
	28-41	4.0-14	7.9-9.0	15-25	0	0.0-2.0	0
	41-60	4.0-14	7.9-9.0	15-25	0	0.0-2.0	0
Seeg, warm-----	0-4	1.0-11	7.9-8.4	5-10	0	0.0-2.0	0
	4-20	4.0-14	7.9-8.4	5-15	0	0.0-2.0	0
	20-30	4.0-14	7.9-8.4	15-30	0	0.0-2.0	0
	30-60	4.0-14	7.9-8.4	15-30	0	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5047: Mack, moist-----	0-7	1.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	7-12	4.0-14	7.9-8.4	5-15	0	0.0-2.0	0
	12-29	4.0-14	7.9-8.4	5-15	0	0.0-2.0	0
	29-50	4.0-14	7.9-8.4	10-20	0	0.0-2.0	0
	50-60	4.0-14	8.5-9.0	10-25	0	0.0-2.0	0
5049: Moffat-----	0-3	1.0-11	7.9-8.4	5-10	0	0.0-2.0	0
	3-18	4.0-14	7.9-8.4	5-10	0	0.0-2.0	0
	18-39	4.0-14	7.9-8.4	10-20	0	0.0-2.0	0
	39-60	4.0-14	7.9-8.4	10-20	0	0.0-2.0	0
Mack, moist-----	0-6	1.0-11	7.4-7.8	5-15	0	0.0-2.0	0
	6-14	4.0-14	7.4-7.8	5-15	0	0.0-2.0	0
	14-25	7.0-17	7.9-8.4	5-15	0	0.0-2.0	0
	25-40	4.0-14	7.9-8.4	15-20	0	0.0-2.0	0
	40-60	4.0-14	7.9-8.4	15-25	0	0.0-2.0	0
5050: Daklos-----	0-3	8.8-19	7.4-7.8	5-10	0	0.0-2.0	0
	3-10	7.7-18	7.4-7.8	5-10	0	0.0-2.0	0
	>10	---	---	---	---	---	---
Arches, dry-----	0-4	2.8-13	7.4-7.8	0-8	0	0.0-2.0	0
	4-16	0.8-11	7.4-7.8	0-8	0	0.0-2.0	0
	>16	---	---	---	---	---	---
5052: Yarts-----	0-2	4.5-14	7.4-7.8	5-10	0	0.0-2.0	0
	2-16	5.5-16	8.5-9.0	5-10	0	0.0-2.0	0
	16-24	4.8-15	8.5-9.0	5-10	0	0.0-2.0	0
	24-54	4.0-14	8.5-9.0	5-10	0	0.0-2.0	0
	54-60	4.8-15	8.5-9.0	5-10	0	0.0-2.0	0
Suwanee-----	0-6	14-24	7.4-7.8	1-5	0-3	0.0-2.0	0
	6-16	12-22	7.4-7.8	1-5	0-3	0.0-2.0	0
	16-27	11-21	7.9-8.4	5-15	0-3	0.0-2.0	0
	27-36	10-20	7.9-8.4	5-15	0-3	0.0-2.0	0
	36-60	4.0-14	7.9-8.4	5-15	0-3	0.0-2.0	0
5053: Milok-----	0-7	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	7-15	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	15-34	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	34-55	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	55-60	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
5055: Mivida-----	0-2	4.5-14	7.4-8.4	5-15	0	0.0-2.0	0
	2-36	4.8-15	7.9-8.4	5-20	0	0.0-2.0	0
	36-60	3.0-13	7.9-8.4	10-25	0	0.0-2.0	0
Barx, dry-----	0-4	7.0-17	7.4-8.4	1-10	0	0.0-2.0	0
	4-11	9.5-20	7.9-8.4	5-10	0	0.0-2.0	0
	11-18	12-22	7.9-8.4	5-10	0	0.0-2.0	0
	18-26	12-22	7.9-9.0	5-15	0	0.0-2.0	0
	26-60	8.0-18	8.5-9.0	10-40	0	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5057:							
Arches, dry-----	0-3	2.8-13	7.9-8.4	3-8	0	0.0-2.0	0
	3-12	0.8-11	7.9-8.4	3-8	0	0.0-2.0	0
	>12	---	---	---	---	---	---
Mident-----	0-3	2.8-13	7.9-8.4	1-5	0	0	0
	3-10	0.8-11	7.9-8.4	1-5	0	0	0
	>10	---	---	---	---	---	---
Yarts-----	0-4	3.5-14	7.4-8.4	5-10	0	0.0-2.0	0
	4-12	3.5-14	7.9-8.4	5-10	0	0.0-2.0	0
	12-42	3.8-14	7.9-8.4	5-10	0	0.0-2.0	0
	42-60	2.0-12	7.9-8.4	5-10	0	0.0-2.0	0
5058:							
Earlweed-----	0-4	1.0-5.0	7.9-8.4	5-10	0	0.0-2.0	0
	4-22	1.0-5.0	7.9-8.4	5-15	0	0.0-2.0	0
	22-36	1.0-5.0	7.9-8.4	10-20	0	0.0-2.0	0
	36-50	1.0-5.0	7.9-8.4	10-20	0	0.0-2.0	0
	50-60	1.0-5.0	7.9-8.4	5-15	0	0.0-2.0	0
Mivida-----	0-2	3.5-14	7.4-8.4	5-10	0	0.0-2.0	0
	2-10	5.5-16	7.9-8.4	5-15	0	0.0-2.0	0
	10-21	4.8-15	7.9-8.4	5-20	0	0.0-2.0	0
	21-28	5.5-16	7.9-8.4	10-25	0	0.0-2.0	0
	28-50	7.0-17	7.9-9.0	10-25	0	0.0-2.0	0
	50-60	3.3-13	7.9-9.0	10-25	0	0.0-2.0	0
5059:							
Mivida-----	0-8	3.5-14	7.4-8.4	5-10	0	0.0-2.0	0
	8-16	4.5-14	7.4-8.4	5-15	0	0.0-2.0	0
	16-28	3.0-13	7.9-8.4	5-15	0	0.0-2.0	0
	28-42	3.0-13	7.9-9.0	10-25	0	0.0-2.0	0
	42-60	3.3-13	7.9-9.0	10-25	0	0.0-2.0	0
Yarts, moist-----	0-6	4.0-14	7.4-8.4	5-10	0	0.0-2.0	0
	6-60	7.8-18	7.9-8.4	5-10	0	0.0-2.0	0
5060:							
Ranion-----	0-7	1.0-11	7.9-8.4	0-2	0	0.0-2.0	0
	7-29	1.0-11	7.9-8.4	0-2	0	0.0-2.0	0
	29-60	0.0-10	7.9-8.4	0-2	0	0.0-2.0	0
Suzipon-----	0-3	1.0-11	7.9-8.4	0-2	0	0.0-2.0	0
	3-8	0.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	8-12	0.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	>12	---	---	---	---	---	---
Navajo Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
5061:							
Navajo Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5061:							
Suzipon-----	0-8	0.0-10	6.6-7.3	0-2	0	0.0-2.0	0
	>8	---	---	---	---	---	---
Peekaboo-----	0-3	0.0-10	6.6-7.3	0-2	0	0.0-2.0	0
	3-22	0.0-9.0	6.6-7.3	0-2	0	0.0-2.0	0
	>22	---	---	---	---	---	---
5062:							
Peekaboo-----	0-4	1.0-11	7.4-8.4	0-2	0	0.0-2.0	0
	4-12	0.0-10	7.4-8.4	0-2	0	0.0-2.0	0
	12-29	0.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	>29	---	---	---	---	---	---
Spooky-----	0-4	1.0-11	7.9-8.4	0-2	0	0.0-2.0	0
	4-14	0.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	14-38	0.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	38-46	0.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	>46	---	---	---	---	---	---
Suzipon-----	0-4	1.0-11	7.9-8.4	0-2	0	0.0-2.0	0
	4-19	0.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	>19	---	---	---	---	---	---
5063:							
Navajo Sandstone and Carmel Formation Rock outcrop-----	0-60	---	---	---	---	---	---
Moenkopie, warm-----	0-6	4.0-14	7.4-8.4	5-10	0	0.0-2.0	0
	6-13	3.0-13	7.9-8.4	5-15	0	0.0-2.0	0
	13-16	---	---	---	---	---	---
	>16	---	---	---	---	---	---
Needle-----	0-5	1.0-11	7.9-8.4	1-3	0	0.0-2.0	0
	5-13	0.0-10	7.9-8.4	3-5	0	0.0-2.0	0
	>13	---	---	---	---	---	---
5065:							
Trail-----	0-12	2.0-12	7.4-8.4	3-10	0	0.0-2.0	0
	12-29	2.0-12	7.9-8.4	3-10	0	0.0-2.0	0
	29-46	2.0-12	7.9-8.4	3-10	0	0.0-2.0	0
	46-60	1.0-11	7.9-8.4	3-10	0	0.0-2.0	0
Sheppard-----	0-6	1.0-11	7.9-8.4	3-10	0	0.0-2.0	0
	6-32	0.0-10	7.9-8.4	3-10	0	0.0-2.0	0
	32-60	0.0-10	7.9-8.4	3-10	0	0.0-2.0	0
5067:							
Ranion-----	0-5	1.3-11	6.6-7.3	0-2	0	0.0-2.0	0
	5-15	0.8-11	6.6-7.3	0-2	0	0.0-2.0	0
	15-35	0.8-11	6.6-7.3	0-2	0	0.0-2.0	0
	35-55	0.1-10	6.6-7.3	0-2	0	0.0-2.0	0
	55-60	0.1-10	7.4-7.8	0-2	0	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5067:							
Peekaboo-----	0-4	1.3-11	6.6-7.8	0-2	0	0.0-2.0	0
	4-23	0.1-10	6.6-7.8	0-2	0	0.0-2.0	0
	23-28	0.1-10	7.4-7.8	0-2	0	0.0-2.0	0
	>28	---	---	---	---	---	---
5068:							
Seeg, warm-----	0-5	1.3-11	7.9-8.4	3-10	0	0.0-2.0	0
	5-12	3.3-13	7.9-8.4	3-10	0	0.0-2.0	0
	12-19	5.8-16	7.9-9.0	5-15	0	0.0-2.0	0
	19-38	5.1-15	8.5-9.0	15-30	0	0.0-2.0	0
	38-60	3.6-14	8.5-9.0	15-30	0	0.0-2.0	0
Moffat-----	0-5	1.3-11	7.4-8.4	5-10	0	0.0-2.0	0
	5-19	1.3-11	7.4-8.4	5-10	0	0.0-2.0	0
	19-35	1.8-12	7.4-8.4	10-20	0	0.0-2.0	0
	35-55	1.1-11	7.9-8.4	10-20	0	0.0-2.0	0
	55-60	1.1-11	7.9-8.4	10-20	0	0.0-2.0	0
Needle-----	0-4	1.3-11	7.4-8.4	2-5	0	0.0-2.0	0
	4-11	0.0-9.8	7.4-8.4	2-5	0	0.0-2.0	0
	11-17	0.0-9.8	7.4-8.4	2-5	0	0.0-2.0	0
	>17	---	---	---	---	---	---
5069:							
Entrada Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
Nepalto, moist-----	0-16	3.0-7.0	7.9-8.4	1-5	0	0.0-2.0	0
	16-34	2.0-6.0	7.9-8.4	5-15	0	0.0-2.0	0
	34-52	0.0-5.0	7.9-8.4	5-15	0	0.0-2.0	0
	52-60	0.0-5.0	7.9-8.4	5-15	0	0.0-2.0	0
5071:							
Somorent-----	0-5	4.0-14	7.9-8.4	5-15	0	0.0-2.0	0
	5-12	3.0-13	7.9-8.4	5-15	0	0.0-2.0	0
	>12	---	---	---	---	---	---
Morrison Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5073:							
Kenzo-----	0-4	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	4-8	6.0-11	8.5-9.0	5-15	0	0.0-2.0	0
	8-15	7.0-12	8.5-9.0	5-15	0	0.0-2.0	0
	>15	---	---	---	---	---	---
Nalcase-----	0-7	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	7-12	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	12-17	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	>17	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5074:							
Evpark-----	0-6	9.0-14	7.4-7.8	1-2	0	0.0-2.0	0
	6-12	10-15	7.8-8.4	1-2	0	0.0-2.0	0
	12-16	11-16	7.8-8.4	1-2	0	0.0-2.0	0
	16-23	12-17	7.8-8.4	1-5	0	0.0-2.0	0
	>23	---	---	---	---	---	---
Vessilla-----	0-2	8.0-13	7.4-7.8	1-5	0	0.0-2.0	0
	2-8	6.0-11	7.4-7.8	1-5	0	0.0-2.0	0
	8-16	6.0-11	7.9-8.4	1-5	0	0.0-2.0	0
	>16	---	---	---	---	---	---
5075:							
Shalona-----	0-8	9.0-19	7.4-8.4	1-2	0	0.0-2.0	0
	8-13	12-22	7.4-8.4	1-2	0	0.0-2.0	0
	13-29	15-25	7.4-8.4	1-5	0	0.0-2.0	0
	29-43	13-23	7.9-8.4	5-15	0	0.0-2.0	0
	43-60	9.0-19	7.9-8.4	5-15	0	0.0-2.0	0
5076:							
Daklos-----	0-4	7.0-17	7.9-8.4	10-20	0	0.0-2.0	0
	4-8	10-20	7.9-8.4	10-20	0	0.0-2.0	0
	>8	---	---	---	---	---	---
Catahoula-----	0-4	10-20	7.9-8.4	8-15	0	0.0-2.0	0
	4-29	10-20	7.9-8.4	10-15	0	0.0-2.0	0
	29-60	10-20	7.9-8.4	10-15	0	0.0-2.0	0
5077:							
Gompers Family-----	0-4	12-17	7.9-8.4	1-5	0	0.0-2.0	0
	4-13	11-16	7.9-8.4	5-15	0	0.0-2.0	0
	>13	---	---	---	---	---	---
Straight Cliffs Formation Rock outcrop-----	0-60	---	---	---	---	---	---
Sheecal Family-----	0-4	10-15	7.9-8.4	1-15	0	0.0-2.0	0
	4-15	12-17	7.9-8.4	5-15	0	0.0-2.0	0
	15-34	18-23	7.9-8.4	5-15	0	0.0-2.0	0
	>34	---	---	---	---	---	---
5078:							
Arabrab-----	0-2	7.0-12	7.4-7.8	1-2	0	0.0-2.0	0
	2-7	11-16	7.4-7.8	1-2	0	0.0-2.0	0
	7-16	18-23	7.4-7.8	1-5	0	0.0-2.0	0
	>16	---	---	---	---	---	---
Vessilla-----	0-6	7.0-12	7.9-8.4	1-5	0	0.0-2.0	0
	6-15	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	15-19	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	>19	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5078:							
Colskel-----	0-4	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	4-10	11-16	7.9-8.4	5-15	0	0.0-2.0	0
	>10	---	---	---	---	---	---
5079:							
Colskel-----	0-7	9.0-14	7.9-8.4	15-30	0	0.0-2.0	0
	7-18	12-17	7.9-8.4	15-30	0	0.0-2.0	0
	>18	---	---	---	---	---	---
Arabrab-----	0-5	9.0-14	7.4-7.8	1-2	0	0.0-2.0	0
	5-10	11-16	7.4-7.8	1-2	0	0.0-2.0	0
	10-19	18-23	7.4-7.8	1-5	0	0.0-2.0	0
	>19	---	---	---	---	---	---
Vessilla-----	0-2	7.0-12	7.4-7.8	1-5	0	0.0-2.0	0
	2-8	6.0-11	7.9-8.4	15-30	0	0.0-2.0	0
	>8	---	---	---	---	---	---
5080:							
Moffat-----	0-5	4.0-14	7.9-8.4	5-10	0	0.0-2.0	0
	5-17	3.0-13	7.9-8.4	5-10	0	0.0-2.0	0
	17-29	3.0-13	7.9-8.4	10-20	0	0.0-2.0	0
	29-60	3.0-13	7.9-8.4	10-20	0	0.0-2.0	0
Moepitz-----	0-7	4.0-14	7.9-8.4	5-10	0	0.0-2.0	0
	7-34	3.0-13	7.9-8.4	5-10	0	0.0-2.0	0
	>34	---	---	---	---	---	---
5081:							
Straight Cliffs and Wahweap Formation Badland-----	0-60	---	---	---	---	---	---
Kydestea Family-----	0-7	13-18	7.4-7.8	1-2	0	0.0-2.0	0
	7-19	12-17	7.4-7.8	1-5	0	0.0-2.0	0
	>19	---	---	---	---	---	---
5082:							
Colskel-----	0-3	12-17	7.9-8.4	1-5	0	0.0-2.0	0
	3-7	12-17	7.9-8.4	5-15	0	0.0-2.0	0
	7-14	13-18	7.9-8.4	15-30	0	0.0-2.0	0
	>14	---	---	---	---	---	---
Menefee-----	0-8	18-23	7.9-8.4	15-30	0-2	4.0-8.0	0
	8-13	---	7.9-8.4	---	---	---	---
	>13	---	---	---	---	---	---
Arabrab-----	0-4	9.0-14	7.9-8.4	1-2	0	0.0-2.0	0
	4-9	11-16	7.9-8.4	1-2	0	0.0-2.0	0
	9-17	12-17	7.9-8.4	1-5	0	0.0-2.0	0
	>17	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5083:							
Colskel-----	0-2	10-15	7.4-7.8	1-5	0	0.0-2.0	0
	2-8	12-17	7.9-8.4	5-15	0	0.0-2.0	0
	>8	---	---	---	---	---	---
Menefee-----	0-3	12-17	7.4-7.8	1-5	0-2	4.0-8.0	0
	3-8	9.0-14	7.9-8.4	15-30	0-2	4.0-8.0	0
	8-20	---	---	---	---	---	---
5085:							
Hillburn-----	0-2	12-17	7.9-8.4	5-15	0	0.0-2.0	0
	2-7	12-17	7.9-8.4	15-30	0	0.0-2.0	0
	7-13	12-17	7.9-8.4	15-30	0	0.0-2.0	0
	>13	---	---	---	---	---	---
5086:							
Mespun-----	0-4	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	4-41	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	41-60	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
Bispen-----	0-4	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	4-52	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	>52	---	---	---	---	---	---
Santrick-----	0-3	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	3-24	1.0-5.0	6.6-7.8	0-2	0	0.0-2.0	0
	>24	---	---	---	---	---	---
5087:							
Kenzo, steep-----	0-4	5.0-10	7.9-8.4	1-3	0	0.0-2.0	0
	4-11	6.0-11	7.9-8.4	1-5	0	0.0-2.0	0
	>11	---	---	---	---	---	---
Kayenta Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5088:							
Calcree-----	0-8	3.0-8.0	6.6-7.3	1-2	0	0.0-2.0	0
	8-15	1.0-6.0	6.6-7.3	1-2	0	0.0-2.0	0
	15-27	1.0-6.0	6.6-7.3	1-2	0	0.0-2.0	0
	>27	---	---	---	---	---	---
Bowington-----	0-16	3.0-8.0	6.6-7.3	1-2	0	0.0-2.0	0
	16-46	1.0-6.0	6.6-7.3	1-2	0	0.0-2.0	0
	46-60	1.0-6.0	6.6-7.3	1-2	0	0.0-2.0	0
Mespun-----	0-2	3.0-8.0	7.4-7.8	0-2	0	0.0-2.0	0
	2-60	1.0-6.0	7.4-7.8	0-2	0	0.0-2.0	0
5089:							
Bowington-----	0-2	1.0-8.0	7.9-8.4	1-2	0	0.0-2.0	0
	2-37	1.0-6.0	7.9-8.4	1-5	0	0.0-2.0	0
	37-49	1.0-6.0	7.9-8.4	1-5	0	0.0-2.0	0
	49-60	2.0-12	7.9-8.4	1-5	0	0.0-2.0	0
	60-62	2.0-12	7.9-8.4	1-5	0	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5089:							
Mespuen-----	0-6	3.0-8.0	6.6-7.3	0-2	0	0.0-2.0	0
	6-11	0.0-5.0	7.4-7.8	0-2	0	0.0-2.0	0
	11-24	0.0-5.0	7.4-7.8	0-2	0	0.0-2.0	0
	24-60	0.0-5.0	7.4-7.8	0-2	0	0.0-2.0	0
5090:							
Baldfield, saline----	0-2	16-32	8.5-9.0	15-30	0	2.0-8.0	0-10
	2-4	14-32	8.5-9.0	15-30	0	2.0-8.0	0-10
	4-15	14-32	8.5-9.0	15-30	0	2.0-8.0	0-10
	15-60	14-32	8.5-9.0	15-30	1-10	2.0-8.0	0-10
5091:							
Brumley-----	0-7	8.0-13	7.4-7.8	1-2	0	0.0-2.0	0
	7-17	13-18	7.4-7.8	1-5	0	0.0-2.0	0
	17-27	13-18	7.9-8.4	5-15	0	0.0-2.0	0
	27-44	12-17	7.9-8.4	15-30	0	0.0-2.0	0
	44-60	9.0-14	8.5-9.0	15-30	0	0.0-2.0	0
5092:							
Navajo Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
Navigon-----	0-4	2.0-7.0	6.6-7.3	0-2	0	0.0-2.0	0
	4-8	0.0-5.0	6.6-7.3	0-2	0	0.0-2.0	0
	>8	---	---	---	---	---	---
5093:							
Robay-----	0-3	5.0-10	6.1-6.5	0-2	0	0.0-2.0	0
	3-10	5.0-10	6.6-7.3	0-2	0	0.0-2.0	0
	>10	---	---	---	---	---	---
Strell-----	0-3	5.0-10	6.6-7.3	0-2	0	0.0-2.0	0
	3-10	5.0-10	6.6-7.3	0-2	0	0.0-2.0	0
	>10	---	---	---	---	---	---
5094:							
Aridic Ustorthents----	0-7	15-20	7.9-8.4	1-5	0	0.0-2.0	0
	7-15	15-20	7.9-8.4	1-3	0	0.0-2.0	0
	15-33	10-15	7.9-8.4	1-3	0	0.0-2.0	0
	33-60	15-20	7.9-8.4	1-3	0	0.0-2.0	0
Yatne-----	0-6	15-20	7.9-8.4	5-15	0	0.0-2.0	0
	6-15	15-20	7.9-8.4	5-15	0	0.0-2.0	0
	15-27	10-15	7.9-8.4	15-30	0	0.0-2.0	0
	27-37	10-15	8.5-9.0	15-30	0	0.0-2.0	0
	37-45	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	45-60	10-15	7.9-8.4	5-15	0	0.0-2.0	0
5095:							
Daklos-----	0-2	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	2-6	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	6-13	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	>13	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5095:							
Hideout-----	0-3	5.0-15	7.4-7.8	15-30	0	0.0-2.0	0
	3-6	5.0-15	7.4-7.8	15-30	0	0.0-2.0	0
	6-9	---	---	---	---	---	---
	>9	---	---	---	---	---	---
Straight Cliffs Formation Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
5096:							
Daklos, steep-----	0-4	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	4-11	10-15	8.5-9.0	15-30	0	0.0-2.0	0
	>11	---	---	---	---	---	---
Straight Cliffs Formation Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
5097:							
Skyvillage-----	0-3	5.0-10	7.9-8.4	1-5	0	0	0
	3-8	10-15	7.9-8.4	5-15	0	0	0
	8-12	---	---	---	---	---	---
	>12	---	---	---	---	---	---
Daklos, saline-----	0-3	10-15	7.9-8.4	15-30	0	0.0-4.0	0
	3-11	10-15	7.9-8.4	15-30	0	0.0-4.0	0
	>11	---	---	---	---	---	---
Wahweap Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5098:							
Daklos, saline-----	0-5	0.0-5.0	7.9-8.4	1-5	0	0.0-4.0	0
	5-10	5.0-10	7.9-8.4	15-30	0	0.0-4.0	0
	>10	---	---	---	---	---	---
Skyvillage, saline---	0-2	8.0-13	7.9-8.4	5-15	0	0.0-4.0	0
	2-7	5.0-10	7.9-8.4	5-15	0	0.0-4.0	0
	>7	---	---	---	---	---	---
Cannonville-----	0-4	25-30	7.9-8.4	15-30	0	4.0-8.0	0
	4-11	25-30	7.9-8.4	15-30	0	4.0-8.0	0
	>11	---	---	---	---	---	---
5100:							
Wingate Formation Rock outcrop-----	0-60	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5100:							
Arches, dry-----	0-1	2.0-7.0	7.9-8.4	1-8	0	0.0-2.0	0
	1-7	3.0-8.0	7.9-8.4	1-8	0	0.0-2.0	0
	7-8	---	---	---	---	---	---
	>8	---	---	---	---	---	---
5101:							
Polychrome Family----	0-18	2.0-7.0	7.9-8.4	5-15	0	2.0-4.0	0
	18-31	5.0-15	7.9-8.4	5-15	0	2.0-4.0	0
	>31	---	---	---	---	---	---
Chinle Formation Badland-----	0-1	40-45	7.4-7.8	---	---	20.0-30.0	---
	1-60	---	---	---	---	---	---
Gaddes Family-----	0-1	6.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	1-18	6.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	18-32	11-16	7.9-8.4	5-15	0	0.0-2.0	0
	>32	---	---	---	---	---	---
5102:							
Chinchin-----	0-4	12-17	7.9-8.4	10-15	0	0.0-2.0	0
	4-10	16-21	7.9-8.4	15-30	0	0.0-2.0	0
	>10	---	---	---	---	---	---
Chinle Formation Badland-----	0-1	40-45	7.4-7.8	---	---	20.0-30.0	---
	1-60	---	---	---	---	---	---
5103:							
Barx-----	0-3	4.0-14	7.4-7.8	1-3	0	0.0-2.0	0
	3-9	3.5-14	7.4-7.8	1-3	0	0.0-2.0	0
	9-28	5.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	28-35	8.0-18	7.9-8.4	10-15	0	0.0-2.0	0
	35-60	7.5-18	8.5-9.0	15-40	0	0.0-2.0	0
Remorris-----	0-1	10-15	7.9-8.4	10-20	0	0.0-2.0	0
	1-6	10-15	7.9-8.4	10-20	0	0.0-2.0	0
	6-9	---	---	---	---	---	---
	>9	---	---	---	---	---	---
5104:							
Shinarump Member, Chinle Formation Rock outcrop-----	0-60	---	---	---	---	---	---
Hideout-----	0-1	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	1-5	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	5-9	---	---	---	---	---	---
	>9	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5105:							
Atchee-----	0-1	2.0-12	7.9-8.4	5-15	0	0.0-2.0	0
	1-4	0.3-10	7.9-8.4	5-15	0	0.0-2.0	0
	4-12	0.0-9.5	7.9-8.4	5-15	0	0.0-2.0	0
	12-15	---	---	---	---	---	---
	>15	---	---	---	---	---	---
Lazear, dry-----	0-4	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	4-15	---	---	---	---	---	---
	>15	---	---	---	---	---	---
Shinarump Member, Chinle Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5106:							
Hillburn, dry-----	0-2	8.0-18	8.5-9.0	5-10	0	0.0-2.0	0
	2-7	6.5-16	8.5-9.0	25-35	0	0.0-2.0	0
	7-15	5.5-16	8.5-9.0	30-50	0	0.0-2.0	0
	>15	---	---	---	---	---	---
Moenkopi Formation Badland-----	0-60	---	---	---	0-15	---	---
5107:							
Simel-----	0-1	2.0-12	7.9-8.4	15-30	0	0.0-2.0	0
	1-4	2.0-12	8.5-9.0	15-30	0	0.0-2.0	0
	4-6	---	---	---	---	---	---
	6-13	---	---	---	---	---	---
	>13	---	---	---	---	---	---
Hillburn, dry-----	0-2	14-24	7.9-8.4	5-15	0	0.0-2.0	0
	2-6	12-22	7.9-8.4	15-30	0	0.0-2.0	0
	>6	---	---	---	---	---	---
5108:							
Hillburn, dry-----	0-1	15-20	7.9-8.4	15-30	0	0.0-2.0	0
	1-6	15-20	7.9-8.4	15-30	0	0.0-2.0	0
	6-9	---	7.9-8.4	---	---	---	---
	>9	---	---	---	---	---	---
Moenkopi Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5109:							
Nonip, dry-----	0-1	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	1-3	10-15	7.9-8.4	15-30	0	0.0-2.0	0
	3-6	10-15	7.9-8.4	15-30	0	0.0-2.0	0
	>6	---	---	---	---	---	---
Moenkopi Formation Rock outcrop-----	0-60	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5110: Reef-----	0-1	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	1-5	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	5-9	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	>9	---	---	---	---	---	---
5111: Nonip, dry-----	0-1	5.0-10	8.5-9.0	5-15	0	0.0-2.0	0
	1-4	10-15	8.5-9.0	15-30	0	0.0-2.0	0
	4-7	10-15	7.9-8.4	15-30	0	0.0-2.0	0
	>7	---	---	---	---	---	---
5112: Barx-----	0-3	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	3-9	10-15	8.4-9.0	10-15	0	0.0-2.0	0
	9-35	10-15	8.4-9.0	10-15	0	0.0-2.0	0
	35-60	10-15	8.4-9.0	15-40	0	0.0-2.0	0
Radnik, moist-----	0-3	5.0-10	7.9-8.4	15-25	0	0.0-2.0	0
	3-6	10-15	8.4-9.0	15-25	0	0.0-2.0	0
	6-16	5.0-10	7.9-8.4	15-25	0	0.0-2.0	0
	16-18	0.0-5.0	7.9-8.4	15-25	0	0.0-2.0	0
	18-35	5.0-10	7.9-8.4	15-25	0	0.0-2.0	0
	35-45	10-15	7.9-8.4	15-25	0	0.0-2.0	0
	45-55	0.0-5.0	7.9-8.4	15-25	0	0.0-2.0	0
	55-60	10-15	7.9-8.4	15-25	0	0.0-2.0	0
Progresso, dry-----	0-3	10-15	7.4-7.8	1-5	0	0.0-2.0	0
	3-16	15-20	7.4-7.8	1-5	0	0.0-2.0	0
	16-39	10-15	7.9-8.4	15-30	0	0.0-2.0	0
	>39	---	---	---	---	---	---
5114: Meriwhitica, moist---	0-2	7.0-17	7.9-8.4	15-30	0	0.0-2.0	0
	2-4	5.5-16	7.9-8.4	15-30	0	0.0-2.0	0
	>4	---	---	---	---	---	---
Mellenthin-----	0-2	7.0-16	7.9-8.4	5-15	0	0.0-2.0	0
	2-6	7.0-16	8.0-8.4	15-30	0	0.0-2.0	0
	6-16	6.0-15	7.9-8.4	15-30	0	0.0-2.0	0
	>16	---	---	---	---	---	---
5115: Sanostee, warm-----	0-4	5.0-10	7.9-8.4	1-5	0	0.0-1.0	0
	4-8	10-15	7.9-8.4	2-15	0	2.0-4.0	0
	8-38	15-20	7.9-8.4	15-30	0	2.0-4.0	0
	38-39	15-20	7.9-8.4	15-30	0	4.0-8.0	5-13
	>39	---	---	---	---	---	---
Daklos-----	0-2	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	2-6	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	6-13	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	>13	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5115: Hideout-----	0-4	5.0-10	7.4-7.8	1-5	0	0.0-2.0	0
	4-6	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	6-11	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	>11	---	---	---	---	---	---
5116: Stent-----	0-4	4.0-14	7.9-8.4	5-15	0	0.0-2.0	0
	4-9	7.5-18	8.5-9.0	5-15	0	0.0-2.0	0
	9-20	7.0-17	8.5-9.0	15-30	0	0.0-2.0	0-1
	20-25	5.0-15	8.5-9.0	15-30	0	0.0-2.0	0-1
	25-35	1.5-12	8.5-9.0	15-30	0	0.0-2.0	0-1
	35-46	6.5-16	8.5-9.0	15-30	0	0.0-2.0	0-1
	46-72	1.5-12	8.5-9.0	10-20	0	0.0-2.0	0-1
	72-79	4.5-14	7.9-8.4	10-20	0	0.0-2.0	0-1
Minchey-----	0-2	0.5-10	7.9-8.4	1-5	0	0.0-2.0	0
	2-6	4.0-14	7.9-8.4	1-5	0	0.0-2.0	0
	6-24	6.0-16	7.9-8.4	15-30	0	0.0-2.0	0
	24-40	8.0-18	8.5-9.0	15-30	0	0.0-2.0	0
	40-49	3.0-13	8.5-9.0	15-30	0	0.0-2.0	0
	49-60	3.0-13	8.5-9.0	15-30	0	0.0-2.0	0
5117: Sheppard-----	0-5	1.0-11	7.9-8.4	3-10	0	0.0-2.0	0
	5-28	0.0-10	7.9-8.4	3-10	0	0.0-2.0	0
	28-60	0.0-10	7.9-8.4	3-10	0	0.0-2.0	0
Carmel and Entrada Formation Badland---	0-1	---	---	---	---	---	---
	1-60	---	---	---	---	---	---
5118: Mido-----	0-29	1.0-5.0	7.4-8.4	1-5	0	0.0-2.0	0
	29-60	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
Kenzo-----	0-2	5.0-10	7.9-8.4	1-2	0	0.0-2.0	0
	2-11	6.0-11	7.9-8.4	1-5	0	0.0-2.0	0
	>11	---	---	---	---	---	---
Carmel Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5120: Pinepoint-----	0-19	5.3-8.5	6.6-7.3	0-2	0	0.0-2.0	0
	19-38	2.5-7.5	6.6-7.3	0-2	0	0.0-2.0	0
	38-60	1.0-6.0	6.6-7.3	0-2	0	0.0-2.0	0
Flatnose-----	0-13	3.6-14	7.4-7.8	1-5	0	0.0-2.0	0
	13-16	5.0-15	7.4-7.8	1-5	0	0.0-2.0	0
	16-31	11-21	7.9-8.4	1-5	0	0.0-2.0	0
	31-41	4.0-14	7.9-8.4	1-5	0	0.0-2.0	0
	41-52	2.2-12	7.9-8.4	15-30	0	0.0-2.0	0
	52-60	9.0-19	7.9-8.4	15-30	0	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5121:							
Trail-----	0-11	1.0-8.5	7.9-8.4	1-5	0	0.0-2.0	0
	11-29	1.0-8.5	7.9-8.4	1-5	0	0.0-2.0	0
	29-60	1.0-8.5	7.9-8.4	1-5	0	0.0-2.0	0
Riverwash-----	---	---	---	---	---	---	---
5122:							
Mido-----	0-4	1.0-5.0	7.4-8.4	1-5	0	0.0-2.0	0
	4-16	1.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
	16-60	1.0-5.0	7.9-8.4	5-10	0	0.0-2.0	0
Mivida-----	0-5	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	5-23	7.0-12	7.9-8.4	1-5	0	0.0-2.0	0
	23-38	7.0-12	7.9-8.4	15-30	0	0.0-2.0	0
	38-60	7.0-12	7.9-8.4	15-30	0	0.0-2.0	0
5123:							
Billings-----	0-4	15-20	7.9-8.4	15-30	0	0.0-4.0	0
	4-27	15-20	8.5-9.0	15-30	0	0.0-4.0	0
	27-31	12-17	8.5-9.0	15-30	0	0.0-4.0	0
	31-43	15-20	7.9-8.4	15-30	0	0.0-4.0	0
	43-64	15-20	7.9-8.4	15-30	2-8	4.0-8.0	0
Jocity, saline-----	0-4	5.0-10	8.5-9.0	15-30	0	0.0-4.0	0-10
	4-20	10-15	8.5-9.0	15-30	0	0.0-2.0	0-10
	20-33	5.0-10	8.5-9.0	15-30	0	0.0-2.0	0-10
	33-37	10-15	7.9-8.4	5-15	0	0.0-2.0	0-10
	37-46	10-15	8.5-9.0	15-30	0	0.0-2.0	0-10
	46-73	10-15	8.5-9.0	15-30	0	0.0-2.0	0-10
	73-79	5.0-10	8.5-9.0	15-30	0	0.0-2.0	0-10
5125:							
Clapper-----	0-3	5.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	3-10	10-20	7.9-8.4	10-15	0	0.0-2.0	0
	10-21	10-20	7.9-8.4	15-30	0	0.0-2.0	0
	21-38	10-20	7.9-8.4	15-30	0	0.0-2.0	0
	38-60	10-20	7.9-8.4	15-30	0	0.0-2.0	0
5126:							
Pinepoint-----	0-6	6.0-9.0	6.6-7.3	0-2	0	0.0-2.0	0
	6-15	2.5-7.5	6.6-7.3	0-2	0	0.0-2.0	0
	15-60	1.0-6.0	6.6-7.3	0-2	0	0.0-2.0	0
Parkwash-----	0-6	1.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	6-13	1.0-10	7.4-7.8	0-2	0	0.0-2.0	0
	>13	---	---	---	---	---	---
5127:							
Skyvillage-----	0-3	3.0-13	7.4-7.8	1-5	0	0.0-2.0	0
	3-8	3.0-13	7.9-8.4	5-15	0	0.0-2.0	0
	8-13	5.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	>13	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5127:							
Mikim-----	0-7	10-20	7.9-8.4	1-10	0	0.0-2.0	0
	7-31	9.0-19	7.9-8.4	1-10	0	0.0-2.0	0
	31-43	9.0-19	8.5-9.0	1-10	0	0.0-2.0	0
	43-60	6.0-16	8.5-9.0	1-10	0	0.0-2.0	0
Kaiparowits Formation	0-1	10-15	7.9-8.4	5-15	---	10.0-20.0	---
Badland-----	1-60	---	---	---	---	---	---
5128:							
Curecanti Family----	0-6	15-20	7.4-7.8	0-3	0	0.0-2.0	0
	6-11	15-20	7.4-7.8	0-3	0	0.0-2.0	0
	11-20	15-20	7.4-7.8	0-3	0	0.0-2.0	0
	20-32	15-20	7.4-7.8	0-3	0	0.0-2.0	0
	>32	---	---	---	---	---	---
Zibetod Family-----	0-4	15-20	7.4-7.8	0-3	0	0.0-2.0	0
	4-9	15-20	7.4-7.8	0-3	0	0.0-2.0	0
	9-18	15-20	7.4-7.8	0-3	0	0.0-2.0	0
	>18	---	---	---	---	---	---
5129:							
Skyvillage-----	0-1	5.0-10	7.4-7.8	1-5	0	0.0-2.0	0
	1-6	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	6-9	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	>9	---	---	---	---	---	---
Wahweap Formation	0-60	---	---	---	---	---	---
Rock outcrop-----							
5130:							
Progresso-----	0-2	5.0-15	7.4-7.8	1-3	0	0.0-2.0	0
	2-12	9.0-19	7.4-7.8	1-3	0	0.0-2.0	0
	12-16	10-20	7.9-8.4	1-5	0	0.0-2.0	0
	16-22	7.0-17	7.9-8.4	15-30	0	0.0-2.0	0
	>22	---	---	---	---	---	---
Begay, dry-----	0-2	0.0-10	6.6-7.3	1-3	0	0.0-2.0	0
	2-8	0.5-10	6.6-7.3	1-3	0	0.0-2.0	0
	8-33	2.0-12	7.4-7.8	1-3	0	0.0-2.0	0
	33-57	1.0-11	7.9-8.4	1-5	0	0.0-2.0	0
	57-60	3.5-14	7.9-8.4	1-5	0	0.0-2.0	0
5131:							
Kaiparowits Formation	0-1	10-15	7.9-8.4	5-15	---	10.0-20.0	---
Badland-----	1-60	---	---	---	---	---	---
Lazear, steep-----	0-2	15-20	7.9-8.4	5-15	0	0.0-2.0	0
	2-6	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	6-10	---	---	---	---	---	---
	>10	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5132:							
Strych-----	0-2	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	2-4	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	4-7	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	7-35	5.0-10	8.5-9.0	15-30	0	0.0-2.0	0
	35-56	10-15	8.5-9.0	15-30	0	0.0-2.0	0
	56-65	5.0-10	8.5-9.0	5-15	0	0.0-2.0	0
Horseshoek-----	0-4	5.0-10	7.4-7.9	1-5	0	0.0-2.0	0
	4-7	10-15	7.4-7.9	1-5	0	0.0-2.0	0
	7-14	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	14-19	0.0-5.0	7.9-8.4	15-40	0	0.0-2.0	0
	19-32	5.0-10	7.9-8.4	15-40	0	0.0-2.0	0
	32-61	0.0-5.0	7.9-8.4	15-40	0	0.0-2.0	0
	61-69	5.0-10	7.9-8.4	15-40	0	0.0-2.0	0
Barx-----	0-6	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	6-11	10-15	7.9-8.4	1-15	0	0.0-2.0	0
	11-24	15-20	7.9-8.4	1-15	0	0.0-2.0	0
	24-41	10-15	8.5-9.0	15-45	0	0.0-2.0	0
	41-60	10-15	8.5-9.0	15-45	0	0.0-2.0	0
5133:							
Menefee-----	0-3	10-20	7.9-8.4	1-5	0	0.0-2.0	0
	3-10	8.0-18	7.9-8.4	1-5	0	0.0-2.0	0
	>10	---	---	---	---	---	---
Kaiparowits Formation Badland-----	0-1	10-15	7.9-8.4	5-15	---	10.0-20.0	---
	1-60	---	---	---	---	---	---
5136:							
Suzmayne-----	0-7	6.5-16	7.9-8.4	1-5	0	0.0-2.0	0
	7-13	8.0-18	7.9-8.4	5-15	0	0.0-2.0	0
	13-27	9.0-19	8.5-9.0	5-15	0	0.0-2.0	0
	>27	---	---	---	---	---	---
Colskel-----	0-6	10-20	7.9-8.4	5-15	0	0.0-2.0	0
	6-17	8.0-18	7.9-8.4	15-30	0	0.0-2.0	0
	>17	---	---	---	---	---	---
Straight Cliffs Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5137:							
Casmos Family-----	0-3	6.5-16	7.9-8.4	5-15	0	0.0-2.0	0
	3-10	7.0-17	7.9-8.4	5-15	0	0.0-2.0	0
	10-13	8.0-18	7.9-8.4	1-5	0	0.0-2.0	0
	>13	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5137:							
Pariette Family-----	0-3	2.5-12	7.9-8.4	1-5	0	0.0-2.0	0
	3-9	8.5-18	7.9-8.4	5-15	0	0.0-2.0	0
	9-15	9.0-19	8.5-9.0	15-30	0	0.0-2.0	0
	15-29	9.0-19	8.5-9.0	15-30	0-3	0.0-2.0	0
	29-38	9.0-19	8.5-9.0	15-30	0-3	0.0-2.0	0
	>38	---	---	---	---	---	---
Dakota and Morrison Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5138:							
Nakai-----	0-3	0.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
	3-21	0.0-5.0	7.9-8.4	5-10	0	0.0-2.0	0
	21-31	3.0-13	7.9-8.4	10-25	0	0.0-2.0	0
	31-63	3.0-13	7.9-8.4	10-25	0	0.0-2.0	0
	63-79	0.0-5.0	7.4-7.8	1-5	0	0.0-2.0	0
Sheppard-----	0-3	1.0-5.0	7.4-7.8	3-10	0	0.0-2.0	0
	3-44	0.0-5.0	7.9-8.4	3-10	0	0.0-2.0	0
	44-61	0.0-5.0	7.9-8.4	3-10	0	0.0-2.0	0
	61-79	0.0-5.0	7.9-8.4	3-10	0	0.0-2.0	0
5139:							
Hetz-----	0-1	---	---	---	---	---	---
	1-8	---	---	---	---	---	---
	8-13	10-15	7.4-7.8	1-5	0	0.0-2.0	0
	13-17	10-15	7.4-7.8	1-5	0	0.0-2.0	0
	17-26	10-15	7.4-7.8	1-5	0	0.0-2.0	0
	26-52	10-15	7.4-7.8	1-5	0	0.0-2.0	0
	52-71	10-15	7.4-7.8	1-5	0	0.0-2.0	0
5140:							
Green River-----	0-7	10-15	7.9-8.4	1-5	0	2.0-4.0	0
	7-14	5.0-10	8.5-9.0	5-15	0	2.0-4.0	0
	14-29	0.0-5.0	7.9-8.4	1-5	0	2.0-4.0	0
	29-37	0.0-5.0	7.9-8.4	1-5	0	2.0-4.0	0
	37-41	5.0-10	7.9-8.4	5-15	0	2.0-4.0	0
	41-48	0.0-5.0	7.9-8.4	5-15	0	2.0-4.0	0
	48-63	0.0-5.0	7.9-8.4	5-15	0	2.0-4.0	0
Radnik, moist-----	0-3	10-15	7.9-8.4	15-25	0	0.0-2.0	0
	3-9	5.0-10	7.4-7.8	15-25	0	0.0-2.0	0
	9-19	5.0-10	7.9-8.4	15-25	0	0.0-2.0	0
	19-30	0.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
	30-36	5.0-10	7.9-8.4	15-25	0	0.0-2.0	0
	36-44	0.0-5.0	7.9-8.4	1-5	0	0.0-2.0	0
	44-50	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	50-59	0.0-5.0	7.9-8.4	15-25	0	0.0-2.0	0
	59-79	10-15	7.9-8.4	1-5	0	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5140: Suwanee, saline-----	0-2	10-15	7.9-8.4	1-5	0	0.0-4.0	0
	2-9	5.0-10	7.9-8.4	1-5	0	0.0-4.0	0
	9-11	10-15	7.9-8.4	1-5	0	0.0-4.0	0
	11-22	5.0-10	7.4-7.8	1-5	0	0.0-4.0	0
	22-28	10-15	7.4-7.8	1-5	0	0.0-4.0	0
	28-38	10-15	7.9-8.4	5-15	0	0.0-4.0	0
	38-50	5.0-10	7.9-8.4	5-15	0	0.0-4.0	0
	50-54	10-15	7.9-8.4	5-15	0	0.0-4.0	0
	54-63	0.0-5.0	7.9-8.4	5-15	0	0.0-4.0	0
5141: Radnik, moist-----	0-2	6.0-16	8.5-9.0	10-25	0	0.0-2.0	0
	2-5	5.0-15	8.5-9.0	10-25	0	0.0-2.0	0
	5-8	6.0-16	7.9-8.4	10-25	0	0.0-2.0	0
	8-11	5.0-15	7.9-8.4	10-25	0	0.0-2.0	0
	11-19	1.0-5.0	7.9-8.4	10-25	0	0.0-2.0	0
	19-45	5.0-15	7.9-8.4	10-25	0	0.0-2.0	0
	45-60	1.0-5.0	7.9-8.4	10-25	0	0.0-2.0	0
Escavada-----	0-16	0.0-5.0	7.4-8.4	1-5	0	0.0-2.0	0
	16-29	0.0-5.0	7.4-8.4	1-5	0	0.0-2.0	0
	29-37	0.0-5.0	7.4-8.4	1-5	0	0.0-2.0	0
	37-60	5.0-10	7.4-8.4	1-3	0	0.0-2.0	0
Suwanee, saline-----	0-8	15-20	7.9-8.4	5-15	0	0.0-4.0	0
	8-16	10-15	8.5-9.0	5-15	0	0.0-4.0	0
	16-37	10-15	8.5-9.0	5-15	0	0.0-4.0	0
	37-39	10-15	8.5-9.0	5-15	0	0.0-4.0	0
	39-45	5.0-10	8.5-9.0	5-15	0	0.0-4.0	0
	45-48	10-15	8.5-9.0	5-15	0	0.0-4.0	0
	48-57	5.0-10	7.9-8.4	5-15	0	0.0-4.0	0
	57-79	0.0-5.0	8.5-9.0	5-15	0	0.0-4.0	0
5142: Alvey-----	0-2	7.0-17	7.9-8.4	5-15	0	0.0-2.0	0
	2-11	10-20	7.9-8.4	5-15	0	0.0-2.0	0
	11-35	12-22	7.9-8.4	15-45	0	0.0-2.0	0
	35-50	13-23	8.5-9.0	15-45	0	0.0-2.0	0
	50-60	12-22	8.5-9.0	15-45	0	0.0-2.0	0
Atrac-----	0-19	6.0-16	7.9-8.4	5-15	0	0.0-2.0	0
	19-29	10-20	7.9-8.4	15-30	0	0.0-2.0	0
	29-60	3.0-13	7.9-8.4	15-30	0	0.0-2.0	0
5143: Elias-----	0-2	7.5-12	8.5-9.0	1-5	0	8.0-16.0	5-10
	2-6	15-20	8.5-9.0	1-5	0	12.0-20.0	13-30
	6-11	10-15	8.5-9.0	5-15	0	12.0-20.0	13-30
	11-13	5.0-10	8.5-9.0	5-15	0	0.0-8.0	13-30
	13-32	5.0-10	8.5-9.0	5-15	0	0.0-8.0	13-30
	32-34	7.5-12	8.5-9.0	5-15	0	0.0-8.0	13-30
	34-63	5.0-10	7.9-8.4	5-15	0-5	0.0-8.0	5-10

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5143:							
Mikim-----	0-4	7.5-12	7.9-8.4	1-10	0	0.0-2.0	0
	4-7	7.5-12	7.9-8.4	5-10	0	0.0-2.0	0
	7-15	10-15	8.5-9.0	5-10	0	0.0-2.0	0
	15-25	7.5-12	8.5-9.0	5-10	0	0.0-2.0	0
	25-28	10-15	7.9-8.4	5-10	0	0.0-2.0	0
	28-33	5.0-10	7.9-8.4	5-10	0	0.0-2.0	0
	33-42	10-15	7.9-8.4	5-10	0-2	0.0-2.0	0
	42-63	2.5-7.5	7.9-8.4	5-10	0-2	0.0-2.0	0
5144:							
Tsaya-----	0-2	9.0-19	7.9-8.4	2-15	0	0.0-2.0	0
	2-8	8.0-18	7.9-8.4	2-15	0	0.0-2.0	0
	8-13	8.0-18	7.9-8.4	2-15	0	0.0-2.0	0
	>13	---	---	---	---	---	---
Straight Cliffs Formation Burnt Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
5146:							
Moffat-----	0-4	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	4-13	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	13-36	10-15	8.5-9.0	10-20	0	0.0-2.0	0
	36-60	10-15	8.5-9.0	10-20	0	0.0-2.0	0
Pagina-----	0-6	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	6-17	5.0-10	7.9-8.4	1-15	0	0.0-2.0	0
	17-35	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	35-57	---	---	---	---	---	---
Sheppard-----	0-1	0.5-10	7.9-8.4	5-10	0	0.0-2.0	0
	1-60	0.5-10	7.9-8.4	5-10	0	0.0-2.0	0
5149:							
Tsaya, saline-----	0-1	5.5-16	7.9-8.4	1-5	0	0.0-4.0	0
	1-2	6.5-16	7.9-8.4	1-5	0	0.0-4.0	0
	2-6	5.0-15	7.9-8.4	1-5	0	0.0-4.0	0
	>6	---	---	---	---	---	---
Straight Cliffs Formation Rock outcrop-----	0-60	---	---	---	---	---	---
Lithic Torriorthents-	0-1	7.5-18	7.9-8.4	1-5	0	0.0-4.0	0-2
	1-9	9.5-20	7.9-8.4	1-5	0	0.0-4.0	0-2
	9-14	---	---	---	---	---	---
	>14	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5150:							
Chipeta-----	0-3	15-20	7.9-8.4	15-30	0-5	2.0-8.0	0-5
	3-11	15-20	7.9-8.4	15-30	1-10	2.0-8.0	0-5
	>11	---	---	---	---	---	---
Hanksville-----	0-3	15-20	8.5-9.0	15-30	0-5	2.0-16.0	2-8
	3-17	15-20	8.5-9.0	15-30	0-5	2.0-16.0	2-8
	17-31	15-20	8.5-9.0	15-30	1-10	2.0-16.0	2-8
	31-38	15-20	8.5-9.0	15-30	1-10	2.0-16.0	2-8
	>38	---	---	---	---	---	---
Tropic Formation Shale Badland-----	0-1	40-45	7.9-8.4	15-30	0-2	5.0-10.0	15-20
	1-60	---	---	---	---	---	---
5151:							
Pinepoint, dry-----	0-8	6.0-9.0	6.6-7.3	0-2	0	0.0-2.0	0
	8-28	5.3-8.5	6.6-7.3	0-2	0	0.0-2.0	0
	28-54	2.5-7.5	6.6-7.3	0-2	0	0.0-2.0	0
	54-60	1.0-6.0	6.6-7.3	0-2	0	0.0-2.0	0
Tenneycanyon-----	0-3	3.6-14	6.6-7.3	0-2	0	0.0-2.0	0
	3-15	2.5-12	6.6-7.3	0-2	0	0.0-2.0	0
	15-29	2.5-12	6.6-7.3	0-2	0	0.0-2.0	0
	29-52	1.3-11	7.4-7.8	0-2	0	0.0-2.0	0
	52-60	1.3-11	7.4-7.8	0-2	0	0.0-2.0	0
	60-65	0.2-10	7.4-7.8	0-5	0	0.0-2.0	0
	>65	---	---	---	---	---	---
Parkwash-----	0-2	1.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	2-6	1.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	6-15	1.0-10	7.4-7.8	0-2	0	0.0-2.0	0
	>15	---	---	---	---	---	---
5154:							
Dient-----	0-6	7.0-17	7.9-8.4	5-15	0	0.0-4.0	0
	6-24	7.0-17	7.9-8.4	5-15	0	0.0-4.0	0
	24-60	6.0-16	7.9-8.4	5-15	0	0.0-4.0	0
Crotoncanyon-----	0-2	15-20	7.9-8.4	1-5	0	0.0-2.0	0
	2-11	15-20	8.5-9.0	15-30	0	0.0-2.0	0
	>11	---	---	---	---	---	---
5155:							
Sanostee, warm-----	0-4	5.0-10	7.4-7.8	1-5	0	0.0-2.0	0
	4-9	10-15	7.4-7.8	1-5	0	0.0-2.0	0
	9-18	10-15	7.4-7.8	1-5	0	2.0-4.0	0-5
	18-26	15-20	8.5-9.0	15-30	0	2.0-4.0	0-5
	26-30	15-20	8.5-9.0	15-30	0	2.0-4.0	0-5
	30-35	15-20	8.5-9.0	15-30	0	4.0-8.0	5-13
	>35	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5155:							
Milok-----	0-5	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	5-28	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	28-49	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	49-60	10-15	7.9-8.4	15-30	0	0.0-2.0	0
Lazear, warm-----	0-4	5.0-10	7.4-7.8	1-5	0	0.0-2.0	0
	4-6	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	6-11	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	>11	---	---	---	---	---	---
5156:							
Daklos, steep-----	0-2	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	2-8	10-15	7.9-8.4	5-10	0	0.0-2.0	0
	8-14	10-15	7.9-8.4	15-30	0	0.0-2.0	0
	>14	---	---	---	---	---	---
Fourmilebench-----	0-2	0.0-10	7.9-8.4	1-10	0	0.0-2.0	0
	2-7	5.5-16	7.9-8.4	1-5	0	0.0-2.0	0
	>7	---	---	---	---	---	---
5157:							
Daklos Family-----	0-3	10-15	7.9-8.4	1-3	0	0.0-2.0	0
	3-11	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	>11	---	---	---	---	---	---
Wahweap Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5158:							
Mellenthin, moist----	0-3	7.0-17	7.4-7.8	1-5	0	0.0-2.0	0
	3-7	8.5-118	7.9-8.4	5-10	0	0.0-2.0	0
	7-12	6.5-16	7.9-8.4	15-30	0	0.0-2.0	0
	>12	---	---	---	---	---	---
Timpoweap Member, Moenkopi Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5159:							
Mellenthin, moist----	0-4	8.0-18	7.4-7.8	1-5	0	0.0-2.0	0
	4-10	7.0-17	7.9-8.4	5-15	0	0.0-2.0	0
	>10	---	---	---	---	---	---
Bowdish-----	0-4	10-15	7.4-7.8	1-5	0	0.0-2.0	0
	4-7	10-15	7.9-8.4	5-10	0	0.0-2.0	0
	7-15	10-15	7.9-8.4	15-30	0	0.0-2.0	0
	15-21	10-15	8.5-9.0	15-30	0	0.0-2.0	0
	>21	---	---	---	---	---	---
5160:							
Timpoweap-----	0-5	10-30	7.4-7.8	1-3	0	0.0-2.0	0
	5-13	30-50	6.6-7.3	1-3	0	0.0-2.0	0
	>13	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5160:							
Evpark-----	0-5	3.7-14	7.4-7.8	1-5	0	0.0-2.0	0
	5-10	4.1-14	6.6-7.3	1-5	0	0.0-2.0	0
	10-18	3.5-14	7.4-7.8	1-5	0	0.0-2.0	0
	18-27	6.8-17	7.4-7.8	1-5	0	0.0-2.0	0
	27-33	8.7-19	7.4-7.8	1-5	0	0.0-2.0	0
	>33	---	---	---	---	---	---
Atarque-----	0-4	5.0-10	6.1-6.5	1-3	0	0.0-2.0	0
	4-8	10-15	6.1-6.5	1-3	0	0.0-2.0	0
	8-18	10-15	6.6-7.3	1-3	0	0.0-2.0	0
	>18	---	---	---	---	---	---
5163:							
Horsemountain, moist-	0-4	5.0-10	7.4-7.9	1-3	0	0.0-2.0	0
	4-11	10-15	7.4-7.9	1-5	0	0.0-2.0	0
	11-19	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	>19	---	---	---	---	---	---
5164:							
Chinle Formation	0-1	40-50	7.4-7.8	---	---	20.0-30.0	---
Badland-----	1-60	---	---	---	---	---	---
5166:							
Hillburn, dry-----	0-2	2.0-12	7.4-7.8	1-5	0	0.0-2.0	0
	2-4	5.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	>4	---	---	---	---	---	---
Sazi, moist-----	0-4	0.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	4-7	1.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	7-24	2.0-12	7.9-8.4	15-30	0	0.0-2.0	0
	>24	---	---	---	---	---	---
5167:							
Progresso, cool-----	0-2	10-15	7.4-7.8	1-3	0	0.0-2.0	0
	2-14	10-15	7.4-7.8	1-3	0	0.0-2.0	0
	14-24	10-15	7.4-7.8	1-3	0	0.0-2.0	0
	24-26	10-15	7.9-8.4	15-25	0	0.0-2.0	0
	>26	---	---	---	---	---	---
Atchee Family-----	0-2	5.0-10	6.6-7.3	1-3	0	0.0-2.0	0
	2-8	10-15	6.6-7.3	1-3	0	0.0-2.0	0
	8-18	---	---	---	---	---	---
	>18	---	---	---	---	---	---
5169:							
Lazear, steep-----	0-4	8.5-18	7.9-8.4	5-15	0	0.0-2.0	0
	4-11	10-20	8.5-9.0	5-15	0	0.0-2.0	0
	>11	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5169:							
Simel-----	0-3	7.0-17	7.9-8.4	10-25	0	0.0-2.0	0
	3-8	10-20	7.9-8.4	10-25	0	0.0-2.0	0
	8-11	7.5-18	7.9-8.4	10-25	0	0.0-2.0	0
	11-14	---	---	---	---	---	---
	>14	---	---	---	---	---	---
Carmel Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5170:							
Lemrac-----	0-3	4.0-14	7.4-7.8	4-14	20-60	2.0-7.0	0-2
	3-9	3.0-13	7.4-7.8	2-5	40-80	0.5-5.5	0-2
	9-22	3.0-13	7.4-7.8	2-5	40-80	0.5-5.5	0-2
	>22	---	---	2-5	40-80	3.0-8.0	---
Simel-----	0-3	10-15	7.4-7.8	15-30	0	0.0-2.0	0
	3-10	10-15	6.6-7.3	15-30	0	0.0-2.0	0
	10-15	---	---	---	60-90	---	---
	>15	---	---	---	---	---	---
Humbug, moist-----	0-3	10-15	7.9-8.4	3-12	0	0.0-4.0	0-2
	3-5	10-15	7.9-8.4	3-12	0	0.0-4.0	0-2
	5-15	7.5-12	7.9-8.4	10-25	0-4	0.0-4.0	0-2
	15-17	7.5-12	7.9-8.4	5-20	5-70	0.0-4.0	0-2
	17-22	5.0-10	7.9-8.4	3-10	40-70	0.0-4.0	0-2
	22-44	5.0-10	7.4-7.8	3-10	40-70	0.0-4.0	0-2
	44-49	5.0-10	7.9-8.4	3-10	40-70	0.0-4.0	0-2
	>49	---	---	---	---	---	---
5171:							
Kenzo-----	0-4	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	4-13	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	>13	---	---	---	---	---	---
Retsabal-----	0-1	6.0-16	7.9-8.4	15-30	20-60	4.0-10.0	0
	1-11	6.0-16	7.9-8.4	15-30	60-80	4.0-10.0	0
	>11	---	---	---	---	---	---
Progresso, cool-----	0-6	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	6-13	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	13-22	10-15	7.9-8.4	15-25	0	0.0-2.0	0
	22-29	5.0-10	7.9-8.4	5-15	0	0.0-2.0	0
	>29	---	---	---	---	---	---
5172:							
Ruinpoint-----	0-2	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	2-10	10-15	7.9-8.4	2-10	0	0.0-2.0	0
	10-25	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	25-60	10-15	7.9-8.4	5-15	0-4	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5172:							
Barx-----	0-2	5.0-15	6.6-7.3	1-3	0	0.0-2.0	0
	2-8	10-25	7.4-7.8	1-3	0	0.0-2.0	0
	8-17	10-25	7.4-7.8	1-15	0	0.0-2.0	0
	17-30	5.0-10	7.4-7.8	15-40	0	0.0-2.0	0
	30-42	5.0-15	7.4-7.8	15-40	0	0.0-2.0	0
	42-61	5.0-15	7.9-8.4	15-40	0	0.0-2.0	0
5173:							
Simel-----	0-2	10-20	7.4-7.8	1-5	0	0.0-2.0	0
	2-6	10-20	7.4-7.8	1-5	0	0.0-2.0	0
	6-8	10-15	7.4-7.8	5-15	0	0.0-2.0	0
	8-10	---	---	---	---	---	---
	>10	---	---	---	---	---	---
Strych, moist-----	0-3	5.0-15	7.4-7.8	1-5	0	0.0-2.0	0
	3-5	10-19	7.9-8.4	1-15	0	0.0-2.0	0
	5-8	10-20	7.9-8.4	15-30	0	0.0-2.0	0
	8-25	5.0-15	7.9-8.4	15-30	0	0.0-2.0	0
	25-39	0.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	39-60	0.0-10	7.9-8.4	8-15	0	0.0-2.0	0
Kenzo-----	0-2	5.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	2-7	6.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	>7	---	---	---	---	---	---
5174:							
Strych-----	0-5	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	5-11	7.0-17	7.9-8.4	1-15	0	0.0-2.0	0
	11-18	5.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	18-60	5.0-10	8.5-9.0	15-30	0	0.0-2.0	0
Sazi, moist-----	0-10	0.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	10-21	5.0-15	7.9-8.4	15-30	0	0.0-2.0	0
	21-29	0.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	29-37	0.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	>37	---	---	---	---	---	---
5180:							
Pinepoint-----	0-6	5.3-8.5	6.6-7.3	0-2	0	0.0-2.0	0
	6-19	2.5-7.5	6.6-7.3	0-2	0	0.0-2.0	0
	19-30	1.0-6.0	6.6-7.3	0-2	0	0.0-2.0	0
	>30	---	---	---	---	---	---
Navajo Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
Parkwash-----	0-2	1.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	2-10	1.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	10-19	1.0-10	7.4-7.8	0-2	0	0.0-2.0	0
	>19	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5181:							
Parklelei-----	0-3	6.0-16	6.6-7.3	1-3	0	0.0-2.0	0
	3-7	5.0-15	6.6-7.3	1-3	0	0.0-2.0	0
	7-13	9.0-19	6.6-7.3	1-3	0	0.0-2.0	0
	13-30	9.0-19	7.4-7.8	1-3	0	0.0-2.0	0
	30-34	9.0-19	7.4-7.8	2-7	0	0.0-2.0	0
	34-44	10-20	7.9-8.4	2-10	0	0.0-2.0	0
	44-61	7.0-17	7.9-8.4	2-10	0	0.0-2.0	0
Plumasano, moist-----	0-4	3.0-13	6.6-7.3	1-3	0	0.0-2.0	0
	4-19	4.0-14	6.6-7.3	1-3	0	0.0-2.0	0
	19-43	0.0-10	6.6-7.3	1-3	0	0.0-2.0	0
	43-61	0.0-8.0	6.6-7.3	1-3	0	0.0-2.0	0
Pinepoint-----	0-6	6.0-9.0	6.6-7.3	0-2	0	0.0-2.0	0
	6-17	5.3-8.5	6.6-7.3	0-2	0	0.0-2.0	0
	17-29	2.5-7.5	6.6-7.3	0-2	0	0.0-2.0	0
	29-42	1.0-6.0	6.6-7.3	0-2	0	0.0-2.0	0
	42-60	1.0-6.0	6.6-7.3	0-2	0	0.0-2.0	0
5182:							
Arabrab-----	0-5	5.0-10	7.9-8.4	1-2	0	0.0-2.0	0
	5-12	10-15	7.9-8.4	1-5	0	0.0-2.0	0
	>12	---	---	---	---	---	---
Colskel-----	0-4	9.0-19	7.9-8.4	15-25	0	0.0-2.0	0
	4-11	7.0-17	7.9-8.4	20-30	0	0.0-2.0	0
	>11	---	---	---	---	---	---
Carmel Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5183:							
Navajo Sandstone Rock outcrop-----	0-60	---	---	---	---	---	---
Parkwash-----	0-13	1.0-10	7.9-8.4	0-2	0	0.0-2.0	0
	>13	---	---	---	---	---	---
Vessilla-----	0-2	8.0-18	7.9-8.4	1-10	0	0.0-2.0	0
	2-6	6.0-16	7.9-8.4	5-15	0	0.0-2.0	0
	6-11	---	---	---	---	---	---
	>11	---	---	---	---	---	---
5185:							
Nomrah-----	0-3	9.0-19	7.4-7.8	1-5	0	0.0-2.0	0
	3-6	7.0-17	7.9-8.4	1-5	0	0.0-2.0	0
	6-11	10-20	7.9-8.4	1-5	0	0.0-2.0	0
	11-18	11-21	7.9-8.4	15-30	0	0.0-2.0	0
	18-36	10-20	7.9-8.4	15-30	0	0.0-2.0	0
	36-47	7.0-17	7.9-8.4	15-25	0	0.0-2.0	0
	47-63	6.0-16	7.9-8.4	20-30	0	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5185:							
Upler-----	0-3	6.0-16	7.9-8.4	5-15	0	0.0-2.0	0
	3-9	11-21	7.9-8.4	5-15	0	0.0-2.0	0
	9-25	4.0-14	7.9-8.4	15-30	0	0.0-2.0	0
	25-35	2.0-12	7.9-8.4	15-30	0	0.0-2.0	0
	35-60	6.0-16	7.9-8.4	15-30	0	0.0-2.0	0
5186:							
Bodot, cool-----	0-2	22-32	7.9-8.4	15-30	0	0.0-2.0	0
	2-33	19-29	7.9-8.4	15-30	0	0.0-2.0	0
	>33	---	---	---	---	---	---
Sili-----	0-2	13-23	7.9-8.4	1-2	0	0	0
	2-5	15-25	7.9-8.4	1-5	0	0	0
	5-28	17-27	7.9-8.4	3-5	0	0.0-2.0	0
	28-60	10-20	7.9-8.4	3-5	0	0.0-2.0	0
5187:							
Zigzag-----	0-3	17-27	7.9-8.4	1-5	0	0.0-2.0	0
	3-9	21-31	7.9-8.4	1-5	0	0.0-2.0	0
	9-14	20-30	7.9-8.4	5-10	0	0.0-2.0	0
	14-30	---	---	---	---	---	---
	>30	---	---	---	---	---	---
Aridic Ustorthents---	0-4	8.0-18	7.9-8.4	15-25	0	0.0-2.0	0
	4-11	11-21	7.9-8.4	20-30	0	0.0-2.0	0
	11-22	14-24	7.9-8.4	15-30	0	0.0-2.0	0
	>22	---	---	---	---	---	---
5188:							
Frandsen-----	0-4	9.0-19	7.9-8.4	15-30	0	0.0-4.0	0
	4-12	10-20	7.9-8.4	15-30	0	0.0-4.0	0-5
	12-44	5.0-15	7.9-8.4	15-30	0	0.0-4.0	0-5
	44-60	7.0-17	7.9-8.4	15-30	0	0.0-4.0	0-5
5189:							
Widtsoe-----	0-10	7.0-17	7.4-7.8	1-5	0	0.0-2.0	0
	10-20	11-21	6.6-7.3	1-5	0	0.0-2.0	0
	20-52	3.0-13	7.9-8.4	15-30	0	0.0-2.0	0
	52-63	2.0-12	7.4-7.8	15-30	0	0.0-2.0	0
Emlin-----	0-3	7.0-17	6.6-7.3	1-5	0	0.0-2.0	0
	3-8	10-20	6.6-7.3	1-5	0	0.0-2.0	0
	8-21	9.0-19	7.4-7.8	5-15	0	0.0-2.0	0
	21-35	10-20	7.9-8.4	15-30	0	0.0-2.0	0
	35-46	9.0-19	7.9-8.4	15-30	0	0.0-2.0	0
	46-60	12-22	7.9-8.4	15-30	0	0.0-2.0	0
5190:							
Podo-----	0-2	1.0-11	7.9-8.4	5-15	0	0.0-2.0	0
	2-10	1.0-11	7.9-8.4	10-30	0	0.0-2.0	0
	>10	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5190: Straight Cliffs and Wahweap Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5191: Ruko-----	0-4	13-28	7.9-8.4	15-30	0	0.0-2.0	0
	4-7	16-32	7.9-8.4	15-30	0	0.0-2.0	0
	7-19	16-32	7.9-8.4	15-30	0	0.0-2.0	0
	>19	---	---	---	---	---	---
Straight Cliffs and Wahweap Formation Rock outcrop-----	0-60	---	---	---	---	---	---
Podo-----	0-4	1.5-12	7.9-8.4	1-5	0	0.0-2.0	0
	4-17	2.5-12	7.9-8.4	15-30	0	0.0-2.0	0
	>17	---	---	---	---	---	---
5192: Gerst Family-----	0-3	8.5-18	7.9-8.4	5-15	0	0.0-4.0	0
	3-12	6.5-16	7.9-8.4	5-15	0	0.0-4.0	0
	>12	---	---	---	---	---	---
Cannonville-----	0-7	20-30	8.4-9.0	15-30	0	4.0-8.0	0-5
	>7	---	---	---	---	---	---
Straight Cliffs and Dakota Formation Rock outcrop-----	0-60	---	---	---	---	---	---
5193: Kaiparowits Formation Badland-----	0-1	10-15	7.9-8.4	5-15	---	10.0-20.0	---
	1-60	---	---	---	---	---	---
5195: Henrieville-----	0-5	4.0-14	7.9-8.4	15-30	0	0.0-2.0	0
	5-13	5.0-15	7.9-8.4	15-30	0	0.0-2.0	0
	13-24	7.0-17	7.9-8.4	15-30	0	0.0-2.0	0
	24-41	1.0-11	7.9-8.4	15-30	0	0.0-2.0	0
	41-61	1.0-11	7.9-8.4	15-30	0	0.0-2.0	0
	61-69	1.0-10	7.9-8.4	15-30	0	0.0-2.0	0
	>69	1.0-10	7.9-8.4	15-30	0	0.0-2.0	0
5198: Bigpack-----	0-2	13-23	7.9-8.4	5-15	0	0.0-2.0	0
	2-12	10-20	7.9-8.4	5-15	0-2	0.0-2.0	0
	12-28	7.0-17	7.9-8.4	5-15	0-2	0.0-2.0	0
	28-60	8.0-18	8.4-9.0	5-15	0-2	0.0-2.0	0

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5199:							
Quagmeier-----	0-6	7.0-17	7.9-8.4	1-5	0	0.0-2.0	0
	6-12	11-21	7.9-8.4	5-15	0	0.0-2.0	0
	12-23	7.0-17	7.9-8.4	20-40	0	0.0-2.0	0
	23-30	10-20	7.9-8.4	20-40	0	0.0-2.0	0
	30-60	7.0-17	8.5-9.0	15-30	0	0.0-2.0	0
Parkelei-----	0-7	7.0-17	6.6-7.3	1-3	0	0.0-2.0	0
	7-19	8.0-18	6.6-7.3	1-3	0	0.0-2.0	0
	19-36	9.0-19	7.4-7.8	1-3	0	0.0-2.0	0
	36-60	9.0-19	7.4-7.8	1-3	0	0.0-2.0	0
5200:							
Sojourn Family-----	0-5	9.0-19	7.9-8.4	5-15	0	0.0-2.0	0
	5-7	8.0-18	7.9-8.4	15-30	0	0.0-2.0	0
	7-15	7.0-17	7.9-8.4	15-30	0	0.0-2.0	0
	>15	---	---	---	---	---	---
Colskel-----	0-3	12-17	7.9-8.4	5-15	0	0.0-2.0	0
	3-8	13-18	7.9-8.4	15-30	0	0.0-2.0	0
	>8	---	---	---	---	---	---
Retsabal-----	0-2	7.0-17	7.4-7.8	5-15	0	0.0-6.0	0
	2-11	4.0-14	7.4-7.8	5-15	35-60	4.0-10.0	0
	11-15	1.0-11	7.4-7.8	5-15	35-60	4.0-10.0	0
	>15	---	---	---	---	---	---
5201:							
Sojourn Family-----	0-4	5.0-15	7.9-8.4	1-3	0	0.0-2.0	0
	4-8	4.0-14	7.9-8.4	1-3	0	0.0-2.0	0
	8-10	2.0-12	7.9-8.4	5-15	0	0.0-2.0	0
	>10	---	---	---	---	---	---
Aridic Ustorthents---	0-4	6.0-16	6.6-7.3	5-15	0	0.0-2.0	0
	4-24	4.0-14	7.4-7.8	15-25	0	0.0-2.0	0
	24-31	2.0-12	7.9-8.4	15-25	0	0.0-2.0	0
	31-33	4.0-14	7.9-8.4	15-25	0	0.0-2.0	0
	>33	---	7.9-8.4	---	---	---	---
5203:							
Wiggler-----	0-3	7.0-18	7.9-8.4	5-15	0	0.0-2.0	0
	3-14	9.0-19	7.9-8.4	15-30	0	0.0-2.0	0
	>14	---	---	---	---	---	---
Curecanti Family, cool-----	0-0	---	---	---	---	---	---
	0-8	10-20	6.6-7.3	0-3	0	0.0-2.0	0
	8-19	10-20	7.4-7.8	0-5	0	0.0-2.0	0
	19-28	11-21	7.9-8.4	5-15	0	0.0-2.0	0
	28-35	6.0-16	8.5-9.0	5-15	0	0.0-2.0	0
	>35	---	---	---	---	---	---

Table 8.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5205:							
Curecanti Family-----	0-1	---	---	---	---	---	---
	1-7	10-20	6.6-7.3	0-3	0	0.0-2.0	0
	7-17	13-23	6.6-7.3	0-3	0	0.0-2.0	0
	17-60	12-22	6.6-7.3	0-3	0	0.0-2.0	0
Curecanti Family, cool-----	0-8	10-20	6.6-7.4	0-3	0	0.0-2.0	0
	8-19	16-26	6.6-7.4	0-5	0	0.0-2.0	0
	19-60	15-25	6.6-7.4	0-5	0	0.0-2.0	0
Widtsoe-----	0-7	11-21	6.6-7.3	1-5	0	0.0-2.0	0
	7-12	13-23	6.6-7.3	1-5	0	0.0-2.0	0
	12-23	16-26	6.6-7.3	1-5	0	0.0-2.0	0
	23-63	11-21	7.4-8.4	15-30	0	0.0-2.0	0
5206:							
Upler-----	0-8	8.0-18	7.9-8.4	1-3	0	0.0-2.0	0
	8-15	9.0-19	7.9-8.4	1-5	0	0.0-2.0	0
	15-26	10-20	7.9-8.4	1-15	0	0.0-2.0	0
	26-60	10-20	7.9-8.4	15-30	0	0.0-2.0	0
5207:							
Winetti-----	0-6	10-20	7.4-7.8	1-5	0	0.0-2.0	0
	6-17	8.0-18	7.9-8.4	5-15	0	0.0-2.0	0
	17-60	1.0-11	7.9-8.4	5-15	0	0.0-2.0	0
Riverwash-----	---	---	---	---	---	---	---
5210:							
Elpedro, moist-----	0-3	3.0-13	7.9-8.4	1-5	0	0.0-2.0	0
	3-9	3.0-13	8.5-9.0	1-5	0	0.0-2.0	0
	9-20	3.0-13	8.5-9.0	2-10	0	0.0-2.0	0
	20-46	11-21	8.5-9.0	2-10	0	0.0-2.0	0
	46-63	13-23	8.5-9.0	2-10	0	0.0-2.0	0
Flatnose-----	0-3	7.0-17	7.4-7.8	1-5	0	0.0-2.0	0
	3-8	7.0-17	7.4-7.8	1-5	0	0.0-2.0	0
	8-15	7.0-17	7.4-7.8	1-5	0	0.0-2.0	0
	15-19	3.0-13	7.9-8.4	15-30	0	0.0-2.0	0
	19-35	6.0-16	7.9-8.4	15-30	0	0.0-2.0	0
	35-60	12-22	7.9-8.4	15-30	0	0.0-2.0	0
5211:							
Yarts, moist-----	0-5	4.0-14	7.9-8.4	5-10	0	0.0-2.0	0
	5-46	5.0-15	7.9-8.4	5-10	0	0.0-2.0	0
	46-60	5.0-15	7.9-8.4	5-10	0	0.0-2.0	0
Sazi, moist-----	0-3	3.0-13	7.9-8.4	1-5	0	0.0-2.0	0
	3-5	4.0-14	7.9-8.4	5-15	0	0.0-2.0	0
	5-15	5.0-15	7.9-8.4	15-30	0	0.0-2.0	0
	15-22	2.0-12	7.9-8.4	15-30	0	0.0-2.0	0
	>22	---	---	---	---	---	---

Table 9.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5001: Mido-----	---	---	Low	High	Moderate
5002: Dune land-----	---	---	Low	---	---
5003: Milok, cool-----	---	---	Moderate	High	Moderate
Barx, dry-----	---	---	Moderate	High	Moderate
5004: Navajo Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5006: Milok, cool-----	---	---	Moderate	High	Moderate
5007: Navajo Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Nalcase-----	Bedrock (lithic)	4-20	Low	Low	Low
5008: Simel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Simel, steep-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
5009: Wayneco, dry-----	Bedrock (lithic)	10-20	Moderate	High	Low
5010: Retsabal-----	Bedrock (paralithic)	4-20	Moderate	High	High
Lemrac-----	Bedrock (paralithic)	20-40	Moderate	High	High
5011: Carmel Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
Rizno, cool-----	Bedrock (lithic)	4-20	Moderate	High	Moderate
Nonip-----	Bedrock (lithic)	4-20	Moderate	High	Moderate
5012: Santrick-----	Bedrock (lithic)	20-40	Moderate	Low	Low
Nalcase-----	Bedrock (lithic)	4-20	Low	Low	Low
Bispen-----	Bedrock (lithic)	40-60	Low	Low	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5013: Mido-----	---	---	Low	High	Moderate
Yarts-----	---	---	Moderate	Moderate	Low
5015: Mespun-----	---	---	Low	Moderate	Low
5017: Skos, dry-----	Bedrock (lithic)	4-20	Moderate	High	Moderate
Mido-----	---	---	Low	Low	Low
Arches, dry-----	Bedrock (lithic)	4-20	Low	Moderate	Moderate
5018: Skos, dry-----	Bedrock (lithic)	4-20	Moderate	High	Moderate
5019: Skos, dry-----	Bedrock (lithic)	4-20	Moderate	High	Moderate
Page Sandstone, Carmel Formation Rock outcrop	Bedrock (lithic)	0-0	---	---	---
Arches, dry-----	Bedrock (lithic)	4-20	Low	Moderate	Moderate
5020: Navajo Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Mespun-----	---	---	Low	Moderate	Low
Nalcase-----	Bedrock (lithic)	4-20	Low	Low	Low
5021: Milok, cool-----	---	---	Moderate	Moderate	Moderate
Anasazi, cool-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
5023: Tsaya-----	Bedrock (lithic)	4-20	Moderate	High	Moderate
5025: Yarts-----	---	---	Moderate	Moderate	Low
5026: Entrada And Carmel Formation Rock outcrop	Bedrock (lithic)	0-0	---	---	---
5027: Tropic Formation Shale Badland-----	Bedrock (paralithic)	0-0	---	---	---
Cannonville-----	Bedrock (paralithic)	4-20	Low	High	High

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5027: Dakota Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5028: Cannonville Member, Entrada Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
5029: Straight Cliffs Formation Rock outcrop	Bedrock (lithic)	0-0	---	---	---
Atchee Family, steep---	Bedrock (lithic)	4-20	Moderate	Moderate	Moderate
Chilton Family-----	Bedrock (lithic)	20-40	Moderate	Moderate	Moderate
5030: Catahoula-----	---	---	Moderate	Low	Low
Clapper, dry-----	---	---	Moderate	High	Moderate
5031: Moclom-----	Bedrock (lithic)	4-20	Low	Low	Low
Morrison Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5032: Remorris-----	Bedrock (paralithic)	4-20	Moderate	High	Moderate
Kenzo, steep-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Morrison And Entrada Formation Rock outcrop	Bedrock (lithic)	0-0	---	---	---
5033: Yarts, eroded-----	---	---	Moderate	Moderate	Low
5034: Nonip-----	Bedrock (lithic)	4-20	Moderate	High	Low
5035: Earlweed-----	---	---	Low	Moderate	Low
Mido-----	---	---	Low	Low	Low
5037: Barx-----	---	---	Moderate	High	Moderate
5038: Mido-----	---	---	Low	Low	Low
Entrada Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5040: Sazi-----	Bedrock (lithic)	20-40	Moderate	High	Moderate
Milok, cool-----	---	---	Moderate	Moderate	Moderate
5041: Seeg, warm-----	---	---	Moderate	Moderate	Low
Pagina-----	Bedrock (paralithic)	20-40	Moderate	High	Low
5042: Moenkopie, warm-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Moepitz-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
Carmel Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5043: Daklos, steep-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Morrison Formation And Romano Mesa Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5044: Dient-----	---	---	Moderate	Moderate	Moderate
5046: Moffat-----	---	---	Moderate	High	Moderate
Sheppard-----	---	---	Low	Moderate	Low
Nakai-----	---	---	Moderate	High	Moderate
5047: Moffat-----	---	---	Moderate	High	Moderate
Seeg, warm-----	---	---	Moderate	Moderate	Low
Mack, moist-----	---	---	Moderate	High	Moderate
5049: Moffat-----	---	---	Moderate	High	Moderate
Mack, moist-----	---	---	Moderate	High	Moderate
5050: Daklos-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Arches, dry-----	Bedrock (lithic)	4-20	Low	Low	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5052: Yarts-----	---	---	Moderate	Moderate	Low
Suwanee-----	---	---	Moderate	Moderate	Low
5053: Milok-----	---	---	Moderate	High	Moderate
5055: Mivida-----	---	---	Moderate	Moderate	Low
Barx, dry-----	---	---	Moderate	High	Moderate
5057: Arches, dry-----	Bedrock (lithic)	4-20	Low	Low	Low
Mident-----	Bedrock (paralithic)	4-20	Low	Moderate	Low
Yarts-----	---	---	Moderate	Moderate	Low
5058: Earlweed-----	---	---	Low	Moderate	Low
Mivida-----	---	---	Moderate	Moderate	Low
5059: Mivida-----	---	---	Moderate	Moderate	Low
Yarts, moist-----	---	---	Moderate	Moderate	Low
5060: Ranion-----	---	---	Low	Low	Low
Suzipon-----	Bedrock (lithic)	4-20	Low	Low	Low
Navajo Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5061: Navajo Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Suzipon-----	Bedrock (lithic)	4-20	Low	Low	Low
Peekaboo-----	Bedrock (lithic)	20-40	---	Low	Low
5062: Peekaboo-----	Bedrock (lithic)	20-40	Low	Low	Low
Spooky-----	Bedrock (lithic)	40-60	Low	Low	Low
Suzipon-----	Bedrock (lithic)	4-20	Low	Low	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5063: Navajo Sandstone And Carmel Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Moenkopie, warm-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Needle-----	Bedrock (lithic)	4-20	Low	Low	Low
5065: Trail-----	---	---	Low	Moderate	Moderate
Sheppard-----	---	---	Low	Moderate	Low
5067: Ranion-----	---	---	Low	Low	Low
Peekaboo-----	Bedrock (lithic)	20-40	Low	Low	Low
5068: Seeg, warm-----	---	---	Moderate	Moderate	Low
Moffat-----	---	---	Moderate	High	Moderate
Needle-----	Bedrock (lithic)	4-20	Low	Low	Low
5069: Entrada Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Nepalto, moist-----	---	---	Low	High	Low
5071: Somorent-----	Bedrock (paralithic)	10-20	Moderate	Low	Low
Morrison Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5073: Kenzo-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Nalcase-----	Bedrock (lithic)	4-20	Low	Low	Low
5074: Evpark-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
Vessilla-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
5075: Shalona-----	---	---	Moderate	Moderate	Moderate
5076: Daklos-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Catahoula-----	---	---	Moderate	Low	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5077: Gompers Family-----	Bedrock (lithic)	4-20	Moderate	High	Moderate
Straight Cliffs Formation Rock outcrop	Bedrock (lithic)	0-0	---	---	---
Sheecal Family-----	Bedrock (lithic)	20-40	Moderate	High	Moderate
5078: Arabrab-----	Bedrock (lithic)	6-20	Moderate	Moderate	Moderate
Vessilla-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Colskel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Moderate
5079: Colskel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Moderate
Arabrab-----	Bedrock (lithic)	6-20	Moderate	Moderate	Moderate
Vessilla-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
5080: Moffat-----	---	---	Moderate	High	Moderate
Moepitz-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
5081: Straight Cliffs And Wahweap Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
Straight Cliffs And Wahweap Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Kydestea Family-----	Bedrock (lithic)	4-20	Moderate	High	Moderate
5082: Colskel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Moderate
Menefee-----	Bedrock (paralithic)	8-20	Moderate	Moderate	Moderate
Arabrab-----	Bedrock (lithic)	6-20	Moderate	Moderate	Moderate
5083: Colskel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Moderate
Menefee-----	Bedrock (paralithic)	8-20	Moderate	Moderate	Moderate
5085: Hillburn-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5086: Mespun-----	---	---	Low	Moderate	Low
Bispen-----	Bedrock (lithic)	40-60	Low	Low	Low
Santrick-----	Bedrock (lithic)	20-40	Low	Low	Low
5087: Kenzo, steep-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Kayenta Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5088: Calcee-----	Bedrock (lithic)	20-40	Moderate	Moderate	Moderate
Bowington-----	---	---	Low	Moderate	Moderate
Mespun-----	---	---	Low	Moderate	Low
5089: Bowington-----	---	---	Low	High	Moderate
Mespun-----	---	---	Low	Moderate	Low
5090: Baldfield, saline-----	---	---	Moderate	High	High
5091: Brumley-----	---	---	Moderate	High	Moderate
5092: Navajo Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Navigon-----	Bedrock (lithic)	4-20	Low	Low	Low
5093: Robay-----	Bedrock (lithic)	4-20	Low	Low	Low
Strell-----	Bedrock (lithic)	4-20	Low	Low	Low
5094: Aridic Ustorthents-----	---	---	Moderate	High	Low
Yatne-----	---	---	Moderate	High	Low
5095: Daklos-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Hideout-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Straight Cliffs Formation Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5096: Daklos, steep-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Straight Cliffs Formation Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5097: Skyvillage-----	Bedrock (lithic)	4-20	Moderate	High	Low
Daklos, saline-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Wahweap Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5098: Daklos, saline-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Skyvillage, saline----	Bedrock (lithic)	4-20	Moderate	Low	Low
Cannonville-----	Bedrock (paralithic)	4-20	Low	Moderate	Low
5100: Wingate Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Arches, dry-----	Bedrock (lithic)	4-20	Low	High	Low
5101: Polychrome Family-----	Bedrock (paralithic)	20-40	Moderate	High	Low
Chinle Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
Gaddes Family-----	Bedrock (paralithic)	20-40	Moderate	High	Low
5102: Chinchin-----	Bedrock (lithic)	4-20	Moderate	High	Low
Chinle Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
5103: Barx-----	---	---	Moderate	High	Low
Remorris-----	Bedrock (paralithic)	4-20	Moderate	High	Low
5104: Shinarump Member, Chinle Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Hideout-----	Bedrock (lithic)	4-20	Moderate	High	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
5105:		In			
Atchee-----	Bedrock (lithic)	4-20	Moderate	High	Low
Lazear, dry-----	Bedrock (lithic)	10-20	Moderate	High	Low
Shinarump Member, Chinle Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5106:					
Hillburn, dry-----	Bedrock (lithic)	4-20	Moderate	High	Low
Moenkopi Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
5107:					
Simel-----	Bedrock (lithic)	4-20	Moderate	High	Low
Hillburn, dry-----	Bedrock (lithic)	4-20	Moderate	High	Low
5108:					
Hillburn, dry-----	Bedrock (lithic)	4-20	Moderate	High	Low
Moenkopi Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5109:					
Nonip, dry-----	Bedrock (lithic)	4-20	Moderate	High	Low
Moenkopi Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5110:					
Reef-----	Bedrock (lithic)	4-20	Moderate	High	Low
5111:					
Nonip, dry-----	Bedrock (lithic)	4-20	Moderate	High	Low
5112:					
Barx-----	---	---	Moderate	High	Low
Radnik, moist-----	---	---	Moderate	High	Low
Progresso, dry-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
5114:					
Meriwhitica, moist----	Bedrock (lithic)	4-10	Moderate	High	Low
Mellenthin-----	Bedrock (lithic)	4-20	Moderate	High	Low
5115:					
Sanostee, warm-----	Bedrock (lithic)	20-40	Moderate	High	Moderate
Daklos-----	Bedrock (lithic)	4-20	Moderate	Low	Low
Hideout-----	Bedrock (lithic)	4-20	Moderate	Low	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5116: Stent-----	---	---	Moderate	High	Low
Minchey-----	---	---	Moderate	High	Low
5117: Sheppard-----	---	---	Low	Moderate	Low
Carmel And Entrada Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
5118: Mido-----	---	---	Low	High	Moderate
Kenzo-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Carmel Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5120: Pinepoint-----	---	---	Low	Moderate	Low
Flatnose-----	---	---	Moderate	High	Low
5121: Trail-----	---	---	Low	Moderate	Moderate
Riverwash-----	---	---	Low	---	---
5122: Mido-----	---	---	Low	High	Moderate
Mivida-----	---	---	Moderate	Moderate	Low
5123: Billings-----	---	---	Moderate	High	Low
Jocity, saline-----	---	---	Moderate	High	Low
5125: Clapper-----	---	---	Moderate	High	Low
5126: Pinepoint-----	---	---	Low	Low	Low
Parkwash-----	Bedrock (lithic)	4-20	Low	Low	Low
5127: Skyvillage-----	Bedrock (lithic)	4-20	Moderate	High	Low
Mikim-----	---	---	Moderate	High	Low
Kaiparowits Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
5128:		In			
Curecanti Family-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
Zibetod Family-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
5129:					
Skyvillage-----	Bedrock (lithic)	4-20	Moderate	High	Low
Wahweap Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5130:					
Progresso-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
Begay, dry-----	---	---	Moderate	Moderate	Low
5131:					
Kaiparowits Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
Lazear, steep-----	Bedrock (lithic)	10-20	Moderate	High	Low
5132:					
Strych-----	---	---	Moderate	High	Low
Horsemountain-----	Petrocalcic	8-20	Moderate	High	Low
Barx-----	---	---	Moderate	High	Low
5133:					
Menefee-----	Bedrock (paralithic)	8-20	Moderate	Moderate	Moderate
Kaiparowits Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
5136:					
Suzmayne-----	Bedrock (lithic)	20-40	Moderate	High	Moderate
Colskel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Moderate
Straight Cliffs Formation Rock outcrop	Bedrock (lithic)	0-0	---	---	---
5137:					
Casmos Family-----	Bedrock (lithic)	4-20	Moderate	High	Low
Pariette Family-----	Bedrock (paralithic)	20-40	Moderate	High	Low
Dakota And Morrison Formation Rock outcrop	Bedrock (lithic)	0-0	---	---	---
5138:					
Nakai-----	---	---	Moderate	High	Moderate
Sheppard-----	---	---	Low	Moderate	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5139: Hetz-----	---	---	Moderate	---	---
5140: Green River-----	---	---	Moderate	High	Low
Radnik, moist-----	---	---	Moderate	High	Low
Suwanee, saline-----	---	---	Moderate	High	Low
5141: Radnik, moist-----	---	---	Moderate	High	Low
Escavada-----	---	---	Moderate	Low	Low
Suwanee, saline-----	---	---	Low	High	Low
5142: Alvey-----	---	---	Moderate	High	Low
Atrac-----	---	---	Moderate	High	Low
5143: Elias-----	---	---	Moderate	High	Moderate
Mikim-----	---	---	Moderate	High	Moderate
5144: Tsaya-----	Bedrock (lithic)	4-20	Moderate	High	Low
Straight Cliffs Formation Burnt Sandstone Rock outcrop	Bedrock (lithic)	0-0	---	---	---
5146: Moffat-----	---	---	Moderate	High	Low
Pagina-----	Bedrock (paralithic)	20-40	Moderate	High	Low
Sheppard-----	---	---	Low	High	Low
5149: Tsaya, saline-----	Bedrock (lithic)	4-20	Moderate	High	Low
Straight Cliffs Formation Rock outcrop	Bedrock (lithic)	0-0	---	---	---
Lithic Torriorthents---	Bedrock (lithic)	4-20	---	High	Low
5150: Chipeta-----	Bedrock (paralithic)	4-20	Low	High	Low
Hanksville-----	Bedrock (paralithic)	20-40	Moderate	High	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5150: Tropic Formation Shale Badland-----	Bedrock (paralithic)	0-0	---	---	---
5151: Pinepoint, dry-----	---	---	Low	Low	Low
Tenneycanyon-----	---	---	Low	Low	Low
Parkwash-----	Bedrock (lithic)	4-20	Low	Low	Low
5154: Dient-----	---	---	Moderate	Moderate	Moderate
Crotoncanyon-----	Bedrock (lithic)	10-20	Moderate	Moderate	Low
5155: Sanostee, warm-----	Bedrock (lithic)	20-40	Moderate	High	Moderate
Milok-----	---	---	Moderate	High	Moderate
Lazear, warm-----	Bedrock (lithic)	10-20	Moderate	Low	Low
5156: Daklos, steep-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Fourmilebench-----	Bedrock (lithic)	4-20	Moderate	High	Low
5157: Daklos Family-----	Bedrock (lithic)	4-20	Moderate	High	Low
Wahweap Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5158: Mellenthin, moist-----	Bedrock (lithic)	4-20	Moderate	High	Low
Timpoweap Member, Moenkopi Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5159: Mellenthin, moist-----	Bedrock (lithic)	4-20	Moderate	High	Low
Bowdish-----	Bedrock (lithic)	20-40	Moderate	High	Low
5160: Timpoweap-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Evpark-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
Atarque-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
5163: Horsemountain, moist---	Petrocalcic	8-20	Moderate	High	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5164: Chinle Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
5166: Hillburn, dry-----	Bedrock (lithic)	4-20	Moderate	High	Low
Sazi, moist-----	Bedrock (lithic)	20-40	Moderate	High	Moderate
5167: Progresso, cool-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
Atchee Family-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
5169: Lazear, steep-----	Bedrock (lithic)	10-20	Moderate	High	Low
Simel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Carmel Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5170: Lemrac-----	Bedrock (paralithic)	20-40	Moderate	High	High
Simel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Humbug, moist-----	Bedrock (paralithic)	40-60	Moderate	High	Moderate
5171: Kenzo-----	Bedrock (lithic)	4-20	Moderate	High	Low
Retsabal-----	Bedrock (paralithic)	4-20	Moderate	High	High
Progresso, cool-----	Bedrock (lithic)	20-40	Moderate	Moderate	Low
5172: Ruinpoint-----	---	---	Moderate	High	Low
Barx-----	---	---	Moderate	High	Moderate
5173: Simel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
Strych, moist-----	---	---	Moderate	High	Low
Kenzo-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
5174: Strych-----	---	---	Moderate	High	Low
Sazi, moist-----	Bedrock (lithic)	20-40	Moderate	High	Moderate

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5180: Pinepoint-----	Bedrock (lithic)	20-40	Low	Low	Low
Navajo Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Parkwash-----	Bedrock (lithic)	4-20	Low	Low	Low
5181: Parkelei-----	---	---	Moderate	Moderate	Low
Plumasano, moist-----	---	---	Moderate	Low	Low
Pinepoint-----	---	---	Low	Low	Low
5182: Arabrab-----	Bedrock (lithic)	6-20	Moderate	Moderate	Low
Colskel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Moderate
Carmel Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5183: Navajo Sandstone Rock outcrop-----	Bedrock (lithic)	0-0	Low	---	---
Parkwash-----	Bedrock (lithic)	4-20	---	Low	Low
Vessilla-----	Bedrock (lithic)	4-20	Moderate	Moderate	Low
5185: Nomrah-----	---	---	Moderate	Low	Low
Upler-----	---	---	Moderate	Low	Low
5186: Bodot, cool-----	Bedrock (paralithic)	20-40	Moderate	High	Moderate
Sili-----	---	---	Moderate	High	Low
5187: Zigzag-----	Bedrock (paralithic)	10-30	Low	High	Low
Aridic Ustorthents-----	Bedrock (paralithic)	20-40	Moderate	Moderate	Moderate
5188: Frandsen-----	---	---	Moderate	High	Moderate
5189: Widtsoe-----	---	---	Moderate	High	Moderate
Emlin-----	---	---	Moderate	High	Moderate

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5190: Podo-----	Bedrock (lithic)	10-20	Moderate	High	Moderate
Straight Cliffs And Wahweap Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5191: Ruko-----	Bedrock (paralithic)	10-20	Low	High	Moderate
Straight Cliffs And Wahweap Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
Podo-----	Bedrock (lithic)	10-20	Moderate	High	Moderate
5192: Gerst Family-----	Bedrock (paralithic)	10-20	Moderate	High	Moderate
Cannonville-----	Bedrock (paralithic)	4-20	Low	High	High
Straight Cliffs And Dakota Formation Rock outcrop-----	Bedrock (lithic)	0-0	---	---	---
5193: Kaiparowits Formation Badland-----	Bedrock (paralithic)	0-0	---	---	---
5195: Henrieville-----	---	---	Moderate	High	Moderate
5198: Bigpack-----	---	---	Moderate	High	Moderate
5199: Quagmeier-----	---	---	Moderate	High	Moderate
Parkelei-----	---	---	Moderate	Moderate	Moderate
5200: Sojourn Family-----	Bedrock (paralithic)	10-20	Moderate	Low	Low
Colskel-----	Bedrock (lithic)	4-20	Moderate	Moderate	Moderate
Retsabal-----	Bedrock (paralithic)	4-20	Moderate	High	High
5201: Sojourn Family-----	Bedrock (paralithic)	10-20	Moderate	Low	Low

Table 9.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5201: Aridic Ustorthents----	Bedrock (paralithic)	20-40	Moderate	Moderate	Moderate
5203: Wiggler-----	Bedrock (paralithic)	4-20	Moderate	High	Moderate
Curecanti Family, cool-	Bedrock (paralithic)	20-40	Moderate	Moderate	Low
5205: Curecanti Family-----	---	---	Moderate	Moderate	Low
Curecanti Family, cool-	---	---	Moderate	Moderate	Low
Widtsoe-----	---	---	Moderate	High	Moderate
5206: Upler-----	---	---	Moderate	Moderate	Low
5207: Winetti-----	---	---	Moderate	High	Moderate
Riverwash-----	---	---	Low	---	---
5210: Elpedro, moist-----	---	---	Moderate	Moderate	Moderate
Flatnose-----	---	---	Moderate	High	Low
5211: Yarts, moist-----	---	---	Moderate	Moderate	Low
Sazi, moist-----	Bedrock (lithic)	20-40	Moderate	High	Moderate

Table 10.--Water Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5001: Mido-----	A	All months	None	None
5002: Dune land-----	A	All months	None	None
5003: Milok, cool-----	A	All months	None	None
Barx, dry-----	B	All months	None	None
5004: Navajo Sandstone Rock outcrop	D	All months	None	None
5006: Milok, cool-----	A	All months	None	None
5007: Navajo Sandstone Rock outcrop	D	All months	None	None
Nalcase-----	D	All months	None	None
5008: Simel-----	D	All months	None	None
Simel, steep-----	D	All months	None	None
5009: Wayneco, dry-----	D	All months	None	None
5010: Retsabal-----	D	All months	None	None
Lemrac-----	B	All months	None	None
5011: Carmel Formation Badland-----	D	All months	None	None

Table 10.--Water Features--continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5011: Rizno, cool-----	D	All months	None	None
Nonip-----	D	All months	None	None
5012: Santrick-----	C	All months	None	None
Nalcase-----	C	All months	None	None
Bispen-----	A	All months	None	None
5013: Mido-----	A	All months	None	None
Yarts-----	A	All months	None	None
5015: Mespun-----	A	All months	None	None
5017: Skos, dry-----	D	All months	None	None
Mido-----	A	All months	None	None
Arches, dry-----	D	All months	None	None
5018: Skos, dry-----	D	All months	None	None
5019: Skos, dry-----	D	All months	None	None
Page Sandstone, Carmel Formation Rock outcrop-----	D	All months	None	None
Arches, dry-----	D	All months	None	None
5020: Navajo Sandstone Rock outcrop	D	All months	None	None

Table 10.--Water Features--continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5020: Mespun-----	A	All months	None	None
Nalcase-----	D	All months	None	None
5021: Milok, cool-----	A	All months	None	None
Anasazi, cool-----	B	All months	None	None
5023: Tsaya-----	D	All months	None	None
5025: Yarts-----	A	All months	None	None
5026: Entrada and Carmel Formation Rock outcrop-----	D	All months	None	None
5027: Tropic Formation Shale Badland-----	D	All months	None	None
Cannonville-----	D	All months	None	None
Dakota Formation Rock outcrop	D	All months	None	None
5028: Cannonville Member, Entrada Formation Badland-----	D	All months	None	None
5029: Straight Cliffs Formation Rock outcrop-----	D	All months	None	None
Atchee family, steep-----	D	All months	None	None
Chilton family-----	B	All months	None	None

Table 10.--Water Features--continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5030: Catahoula-----	B	All months	None	None
Clapper, dry-----	B	All months	None	None
5031: Moclom-----	D	All months	None	None
Morrison Formation Rock outcrop-----	D	All months	None	None
5032: Remorris-----	D	All months	None	None
Kenzo, steep-----	D	All months	None	None
Morrison and Entrada Formation Rock outcrop-----	D	All months	None	None
5033: Yarts, eroded-----	A	All months	None	None
5034: Nonip-----	D	All months	None	None
5035: Earlweed-----	A	All months	None	None
Mido-----	A	All months	None	None
5037: Barx-----	B	All months	None	None
5038: Mido-----	A	All months	None	None
Entrada Sandstone Rock outcrop-----	D	All months	None	None

Table 10.--Water Features--continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5040: Sazi-----	B	All months	None	None
Milok, cool-----	A	All months	None	None
5041: Seeg, warm-----	A	All months	None	None
Pagina-----	B	All months	None	None
5042: Moenkopie, warm-----	C	All months	None	None
Moepitz-----	B	All months	None	None
Carmel Formation Rock outcrop	D	All months	None	None
5043: Daklos, steep-----	D	All months	None	None
Morrison Formation and Romano Mesa Sandstone Rock outcrop-	D	All months	None	None
5044: Dient-----	B	All months	None	None
5046: Moffat-----	A	All months	None	None
Sheppard-----	A	All months	None	None
Nakai-----	A	All months	None	None
5047: Moffat-----	A	All months	None	None
Seeg, warm-----	A	All months	None	None
Mack, moist-----	B	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5049: Moffat-----	A	All months	None	None
Mack, moist-----	B	All months	None	None
5050: Daklos-----	D	All months	None	None
Arches, dry-----	D	All months	None	None
5052: Yarts-----	A	All months	None	None
Suwanee-----	C	All months	None	None
5053: Milok-----	A	All months	None	None
5055: Mivida-----	A	All months	None	None
Barx, dry-----	B	All months	None	None
5057: Arches, dry-----	D	All months	None	None
Mident-----	C	All months	None	None
Yarts-----	A	All months	None	None
5058: Earlweed-----	A	All months	None	None
Mivida-----	A	All months	None	None
5059: Mivida-----	A	All months	None	None
Yarts, moist-----	A	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5060: Ranion-----	A	All months	None	None
Suzipon-----	C	All months	None	None
Navajo Sandstone Rock outcrop	D	All months	None	None
5061: Navajo Sandstone Rock outcrop	D	All months	None	None
Suzipon-----	D	All months	None	None
Peekaboo-----	C	All months	None	None
5062: Peekaboo-----	C	All months	None	None
Spooky-----	A	All months	None	None
Suzipon-----	C	All months	None	None
5063: Navajo Sandstone and Carmel Formation Rock outcrop-----	D	All months	None	None
Moenkopie, warm-----	C	All months	None	None
Needle-----	D	All months	None	None
5065: Trail-----	A	All months	None	None
Sheppard-----	A	All months	None	None
5067: Ranion-----	A	All months	None	None
Peekaboo-----	A	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5068: Seeg, warm-----	A	All months	None	None
Moffat-----	A	All months	None	None
Needle-----	D	All months	None	None
5069: Entrada Sandstone Rock outcrop-----	D	All months	None	None
Nepalto, moist-----	A	All months	None	None
5071: Somorent-----	D	All months	None	None
Morrison Formation Rock outcrop-----	D	All months	None	None
5073: Kenzo-----	D	All months	None	None
Nalcase-----	C	All months	None	None
5074: Evpark-----	C	All months	None	None
Vessilla-----	D	All months	None	None
5075: Shalona-----	C	All months	None	None
5076: Daklos-----	D	All months	None	None
Catahoula-----	B	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5077: Gompers family-----	C	All months	None	None
Straight Cliffs Formation Rock outcrop-----	D	All months	None	None
Sheecal family-----	C	All months	None	None
5078: Arabrab-----	D	All months	None	None
Vessilla-----	D	All months	None	None
Colskel-----	D	All months	None	None
5079: Colskel-----	D	All months	None	None
Arabrab-----	D	All months	None	None
Vessilla-----	D	All months	None	None
5080: Moffat-----	A	All months	None	None
Moepitz-----	B	All months	None	None
5081: Straight Cliffs and Wahweap Formation Badland-----	D	All months	None	None
Straight Cliffs and Wahweap Formation Rock outcrop-----	D	All months	None	None
Kydestea family-----	D	All months	None	None
5082: Colskel-----	D	All months	None	None



Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5088: Mespun-----	A	All months	None	None
5089: Bowington-----	A	March	Very brief	Very rare
		April	Very brief	Rare
		May	Very brief	Rare
		June	Very brief	Rare
		July	Very brief	Rare
		August	Very brief	Rare
		September	Very brief	Rare
		October	Very brief	Very rare
Mespun-----	A	All months	None	None
5090: Baldfield, saline-----	D	All months	None	None
5091: Brumley-----	B	All months	None	None
5092: Navajo Sandstone Rock outcrop	D	All months	None	None
Navigon-----	D	All months	None	None
5093: Robay-----	D	All months	None	None
Strell-----	D	All months	None	None
5094: Aridic Ustorthents-----	B	All months	None	None
Yatne-----	B	All months	None	None
5095: Daklos-----	D	All months	None	None
Hideout-----	D	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5095: Straight Cliffs Formation Sandstone Rock outcrop-----	D	All months	None	None
5096: Daklos, steep-----	D	All months	None	None
Straight Cliffs Formation Sandstone Rock outcrop-----	D	All months	None	None
5097: Skyvillage-----	D	All months	None	None
Daklos, saline-----	D	All months	None	None
Wahweap Formation Rock outcrop-----	D	All months	None	None
5098: Daklos, saline-----	D	All months	None	None
Skyvillage, saline-----	D	All months	None	None
Cannonville-----	D	All months	None	None
5100: Wingate Formation Rock outcrop-----	D	All months	None	None
Arches, dry-----	D	All months	None	None
5101: Polychrome family-----	B	All months	None	None
Chinle Formation Badland-----	D	All months	None	None
Gaddes family-----	C	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5102: Chinchin-----	D	All months	None	None
Chinle Formation Badland----	D	All months	None	None
5103: Barx-----	B	All months	None	None
Remorris-----	D	All months	None	None
5104: Shinarump Member, Chinle Formation Rock outcrop-----	D	All months	None	None
Hideout-----	D	All months	None	None
5105: Atchee-----	D	All months	None	None
Lazear, dry-----	D	All months	None	None
Shinarump Member, Chinle Formation Rock outcrop-----	D	All months	None	None
5106: Hillburn, dry-----	D	All months	None	None
Moenkopi Formation Badland--	D	All months	None	None
5107: Simel-----	D	All months	None	None
Hillburn, dry-----	D	All months	None	None
5108: Hillburn, dry-----	D	All months	None	None
Moenkopi Formation Rock outcrop-----	D	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5109: Nonip, dry-----	D	All months	None	None
Moenkopi Formation Rock outcrop-----	D	All months	None	None
5110: Reef-----	D	All months	None	None
5111: Nonip, dry-----	D	All months	None	None
5112: Barx-----	B	All months	None	None
Radnik, moist-----	B	July	Extremely brief	Very rare
		August	Extremely brief	Very rare
		September	Extremely brief	Very rare
Progresso, dry-----	C	All months	None	None
5114: Meriwhitica, moist-----	D	All months	None	None
Mellenthin-----	D	All months	None	None
5115: Sanostee, warm-----	C	All months	None	None
Daklos-----	D	All months	None	None
Hideout-----	D	All months	None	None
5116: Stent-----	B	All months	None	None
Minchey-----	B	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5117: Sheppard-----	A	All months	None	None
Carmel and Entrada Formation Badland-----	D	All months	None	None
5118: Mido-----	A	All months	None	None
Kenzo-----	D	All months	None	None
Carmel Formation Rock outcrop	---	All months	None	None
5120: Pinepoint-----	A	All months	None	None
Flatnose-----	B	All months	None	None
5121: Trail-----	A	July August September	Very brief Very brief Extremely brief	Occasional Occasional Rare
Riverwash-----	D	June July August September October	Very brief Very brief Very brief Brief Brief	Very rare Occasional Occasional Occasional Occasional
5122: Mido-----	A	All months	None	None
Mivida-----	A	All months	None	None
5123: Billings-----	C	June July August September October	Extremely brief Very brief Very brief Very brief Extremely brief	Very rare Rare Rare Rare Very rare

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5123: Jocity, saline-----	B	June	Extremely brief	Very rare
		July	Very brief	Rare
		August	Very brief	Rare
		September	Very brief	Rare
		October	Extremely brief	Rare
5125: Clapper-----	B	All months	None	None
5126: Pinepoint-----	A	All months	None	None
Parkwash-----	C	All months	None	None
5127: Skyvillage-----	D	All months	None	None
Mikim-----	B	All months	None	None
Kaiparowits Formation Badland	D	All months	None	None
5128: Curecanti family-----	C	All months	None	None
Zibetod family-----	D	All months	None	None
5129: Skyvillage-----	D	All months	None	None
Wahweap Formation Rock outcrop-----	D	All months	None	None
5130: Progresso-----	C	All months	None	None
Begay, dry-----	A	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5131: Kaiparowits Formation Badland	D	All months	None	None
Lazear, steep-----	D	All months	None	None
5132: Strych-----	B	All months	None	None
Horsemountain-----	D	All months	None	None
Barx-----	B	All months	None	None
5133: Menefee-----	D	All months	None	None
Kaiparowits Formation Badland	---	All months	None	None
5136: Suzmayne-----	C	All months	None	None
Colskel-----	D	All months	None	None
Straight Cliffs Formation Rock outcrop-----	D	All months	None	None
5137: Casmos family-----	D	All months	None	None
Pariette family-----	B	All months	None	None
Dakota and Morrison Formation Rock outcrop-----	D	All months	None	None
5138: Nakai-----	A	All months	None	None
Sheppard-----	A	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5139: Hetz-----	B/D	January	---	None
		February	---	None
		March	---	None
		April	Very brief	Rare
		May	Brief	Occasional
		June	Very brief	Rare
		July	---	None
		August	Very brief	Rare
		September	Very brief	Rare
		October	---	None
		November	---	None
		December	---	None
5140: Green River-----	A	March	Very brief	Rare
		April	Very brief	Rare
		May	Very brief	Rare
		June	Very brief	Rare
Radnik, moist-----	B	March	Very brief	Rare
		April	Very brief	Rare
		May	Very brief	Rare
		June	Very brief	Rare
		July	Extremely brief	Very rare
		August	Extremely brief	Very rare
Suwanee, saline-----	B	March	Very brief	Rare
		April	Very brief	Rare
		May	Very brief	Rare
		June	Very brief	Rare
5141: Radnik, moist-----	A	March	Very brief	Rare
		April	Very brief	Rare
		May	Very brief	Rare
		July	Extremely brief	Very rare
		August	Extremely brief	Very rare
September	Extremely brief	Very rare		

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5141: Escavada-----	A	March	Very brief	Rare
		April	Very brief	Rare
		May	Very brief	Rare
		July	Extremely brief	Very rare
		August	Extremely brief	Very rare
		September	Extremely brief	Very rare
Suwanee, saline-----	B	March	Very brief	Rare
		April	Very brief	Rare
		May	Very brief	Rare
		July	Extremely brief	Very rare
		August	Extremely brief	Very rare
		September	Extremely brief	Very rare
5142: Alvey-----	C	All months	None	None
Atrac-----	B	All months	None	None
5143: Elias-----	C	All months	None	None
Mikim-----	B	All months	None	None
5144: Tsaya-----	D	All months	None	None
Straight Cliffs Formation Burnt Sandstone Rock outcrop	D	All months	None	None
5146: Moffat-----	B	All months	None	None
Pagina-----	A	All months	None	None
Sheppard-----	A	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5149: Tsaya, saline-----	D	All months	None	None
Straight Cliffs Formation Rock outcrop-----	D	All months	None	None
Lithic Torriorthents-----	D	All months	None	None
5150: Chipeta-----	D	All months	None	None
Hanksville-----	D	All months	None	None
Tropic Formation Shale Badland-----	D	All months	None	None
5151: Pinepoint, dry-----	A	All months	None	None
Tenneycanyon-----	A	All months	None	None
Parkwash-----	C	All months	None	None
5154: Dient-----	B	All months	None	None
Crotoncanyon-----	D	All months	None	None
5155: Sanostee, warm-----	C	All months	None	None
Milok-----	A	All months	None	None
Lazear, warm-----	D	All months	None	None
5156: Daklos, steep-----	D	All months	None	None
Fourmilebench-----	D	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5157: Daklos family-----	D	All months	None	None
Wahweap Formation Rock outcrop-----	D	All months	None	None
5158: Mellenthin, moist-----	D	All months	None	None
Timpoweap Member, Moenkopi Formation Rock outcrop-----	D	All months	None	None
5159: Mellenthin, moist-----	D	All months	None	None
Bowdish-----	C	All months	None	None
5160: Timpoweap-----	D	All months	None	None
Evpark-----	B	All months	None	None
Atarque-----	D	All months	None	None
5163: Horsemountain, moist-----	D	All months	None	None
5164: Chinle Formation Badland-----	D	All months	None	None
5166: Hillburn, dry-----	D	All months	None	None
Sazi, moist-----	C	All months	None	None
5167: Progresso, cool-----	C	All months	None	None
Atchee family-----	D	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5169: Lazear, steep-----	D	All months	None	None
Simel-----	D	All months	None	None
Carmel Formation Rock outcrop	D	All months	None	None
5170: Lemrac-----	C	All months	None	None
Simel-----	D	All months	None	None
Humbug, moist-----	A	All months	None	None
5171: Kenzo-----	D	All months	None	None
Retsabal-----	D	All months	None	None
Progresso, cool-----	C	All months	None	None
5172: Ruinpoint-----	C	All months	None	None
Barx-----	C	All months	None	None
5173: Simel-----	D	All months	None	None
Strych, moist-----	B	All months	None	None
Kenzo-----	D	All months	None	None
5174: Strych-----	B	All months	None	None
Sazi, moist-----	B	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5180: Pinepoint-----	B	All months	None	None
Navajo Sandstone Rock outcrop	D	All months	None	None
Parkwash-----	C	All months	None	None
5181: Parkelei-----	C	All months	None	None
Plumasano, moist-----	A	All months	None	None
Pinepoint-----	A	All months	None	None
5182: Arabrab-----	D	All months	None	None
Colskel-----	D	All months	None	None
Carmel Formation Rock outcrop	D	All months	None	None
5183: Navajo Sandstone Rock outcrop	D	All months	None	None
Parkwash-----	C	All months	None	None
Vessilla-----	D	All months	None	None
5185: Nomrah-----	B	All months	None	None
Upler-----	B	All months	None	None
5186: Bodot, cool-----	D	All months	None	None
Sili-----	C	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5187: Zigzag-----	D	All months	None	None
Aridic Ustorthents-----	C	All months	None	None
5188: Frandsen-----	B	All months	None	None
5189: Widtsoe-----	B	All months	None	None
Emlin-----	C	All months	None	None
5190: Podo-----	D	All months	None	None
Straight Cliffs and Wahweap Formation Rock outcrop-----	D	All months	None	None
5191: Ruko-----	D	All months	None	None
Straight Cliffs and Wahweap Formation Rock outcrop-----	D	All months	None	None
Podo-----	D	All months	None	None
5192: Gerst family-----	D	All months	None	None
Cannonville-----	D	All months	None	None
Straight Cliffs and Dakota Formation Rock outcrop-----	D	All months	None	None
5193: Kaiparowits Formation Badland	D	All months	None	None
5195: Henrieville-----	A	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding	
			Duration	Frequency
5198: Bigpack-----	C	All months	None	None
5199: Quagmeier-----	C	All months	None	None
Parkelai-----	B	All months	None	None
5200: Sojourn family-----	D	All months	None	None
Colskel-----	D	All months	None	None
Retsabal-----	D	All months	None	None
5201: Sojourn family-----	D	All months	None	None
Aridic Ustorhents-----	B	All months	None	None
5203: Wiggler-----	D	All months	None	None
Curecanti family, cool-----	C	All months	None	None
5205: Curecanti family-----	B	All months	None	None
Curecanti family, cool-----	B	All months	None	None
Widtsoe-----	B	All months	None	None
5206: Upler-----	B	All months	None	None

Table 10.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Flooding		
			Duration	Frequency	
5207: Winetti-----	B	March	Brief	Rare	
		April	Brief	Rare	
		May	Brief	Rare	
		June	Brief	Rare	
Riverwash-----	D	March	Brief	Rare	
		April	Brief	Rare	
		May	Very brief	Very rare	
		June	Extremely brief	Very rare	
		July	Extremely brief	Very rare	
		August	Extremely brief	Very rare	
		September	Extremely brief	Very rare	
5210: Elpedro, moist-----		B	All months	None	None
Flatnose-----		B	All months	None	None
5211: Yarts, moist-----	A	All months	None	None	
Sazi, moist-----	C	All months	None	None	

Table 11.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Alvey-----	Fine-loamy, mixed, superactive, mesic Ustic Calciargids
Anasazi-----	Coarse-loamy, mixed, superactive, mesic Ustic Haplocalcids
Arabrab-----	Loamy, mixed, superactive, mesic Lithic Haplustalfs
Arches-----	Mixed, mesic Lithic Torripsamments
Aridic Ustorthents-----	Aridic Ustorthents
Atarque-----	Loamy, mixed, superactive, mesic Lithic Haplustalfs
Atchee-----	Loamy-skeletal, mixed, active, calcareous, mesic Lithic Ustic Torriorthents
Atchee family-----	Loamy-skeletal, mixed, active, calcareous, mesic Lithic Ustic Torriorthents
Atrac-----	Fine-loamy, mixed, superactive, mesic Ustic Haplocambids
Baldfield-----	Fine, smectitic, calcareous, mesic Ustertic Torriorthents
Barx-----	Fine-loamy, mixed, superactive, mesic Ustic Calciargids
Begay-----	Coarse-loamy, mixed, superactive, mesic Ustic Haplocambids
Bigpack-----	Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents
Billings-----	Fine-silty, mixed, active, calcareous, mesic Typic Torrifluvents
Bispen-----	Siliceous, mesic Ustic Torripsamments
Bodot-----	Fine, smectitic, calcareous, mesic Torrertic Ustorthents
Bowdish-----	Fine-loamy, mixed, superactive, mesic Ustic Haplocalcids
Bowington-----	Sandy, mixed, mesic Oxyaquic Torrifluvents
Brumley-----	Fine-loamy, mixed, superactive, mesic Calcidic Haplustalfs
Calcree-----	Sandy, mixed, mesic Aeric Endoaquents
Cannonville-----	Clayey, smectitic, calcareous, mesic, shallow Ustic Torriorthents
Casmos family-----	Loamy, mixed, superactive, calcareous, mesic Lithic Torriorthents
Catahoula-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Ustic Torriorthents
Chilton family-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Ustic Torriorthents
Chinchin-----	Loamy, mixed, superactive, mesic Lithic Calciargids
Chipeta-----	Clayey, mixed, active, calcareous, mesic, shallow Typic Torriorthents
Clapper-----	Loamy-skeletal, mixed, superactive, mesic Ustic Haplocalcids
Colskel-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Aridic Lithic Ustorthents
Crotoncanyon-----	Loamy-skeletal, mixed, superactive, mesic Lithic Haplocalcids
Curecanti family-----	Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls
Daklos-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Daklos family-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Dient-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Typic Torriorthents
Earlweed-----	Sandy, mixed, mesic Ustic Haplocalcids
Elias-----	Fine-loamy, mixed, superactive, mesic Ustic Natrargids
Elpedro-----	Fine-silty, mixed, superactive, mesic Aridic Haplustalfs
Emlin-----	Fine-loamy, mixed, superactive, frigid Calcidic Argiustolls
Escavada-----	Sandy, mixed, mesic Ustic Torrifluvents
Evpark-----	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
*Flatnose-----	Coarse-loamy, mixed, superactive, calcareous, mesic Typic Ustifluvents
Fourmilebench-----	Loamy-skeletal, mixed, superactive, mesic Lithic Ustic Haplargids
Frandsen-----	Fine-loamy, mixed, superactive, frigid Aridic Haplustepts
Gaddes family-----	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Gerst family-----	Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents
Gompers family-----	Loamy-skeletal, mixed, superactive, calcareous, frigid Aridic Lithic Ustorthents
Green River-----	Coarse-loamy, mixed, superactive, calcareous, mesic Oxyaquic Torrifluvents
Hanksville-----	Fine, mixed, active, calcareous, mesic Typic Torriorthents
Henrieville-----	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Hetz-----	Fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls
Hideout-----	Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Hillburn-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

Table 11.--Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Horsemountain-----	Loamy, mixed, superactive, mesic, shallow Ustalfic Petrocalcids
Humbug-----	Coarse-loamy, gypsic, mesic Ustic Calcigypsid
Jocity-----	Fine-loamy, mixed, superactive, calcareous, mesic Typic Torrifluvents
Kenzo-----	Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Kydestea family-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Aridic Lithic Ustorthents
Lazear-----	Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Lemrac-----	Coarse-loamy, gypsic, mesic Ustic Torriorthents
Lithic Torriorthents-----	Lithic Torriorthents
Mack-----	Fine-loamy, mixed, superactive, mesic Typic Calciargids
Mellenthin-----	Loamy-skeletal, mixed, superactive, mesic Lithic Ustic Haplocalcids
Menefee-----	Loamy, mixed, active, calcareous, mesic, shallow Aridic Ustorthents
Merihwita-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Mespun-----	Siliceous, mesic Ustic Torripsamments
Mident-----	Mixed, mesic, shallow Ustic Torripsamments
Mido-----	Mixed, mesic Ustic Torripsamments
Mikim-----	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Milok-----	Coarse-loamy, mixed, superactive, mesic Ustic Haplocalcids
Minchey-----	Fine-loamy, mixed, active, mesic Typic Haplocalcids
Mivida-----	Coarse-loamy, mixed, superactive, mesic Ustic Haplocalcids
Moclon-----	Mixed, mesic Lithic Torripsamments
Moenkopie-----	Loamy, mixed, superactive, calcareous, mesic Lithic Torriorthents
Moepitz-----	Coarse-loamy, mixed, superactive, calcareous, mesic Typic Torriorthents
Moffat-----	Coarse-loamy, mixed, superactive, mesic Typic Haplocalcids
Nakai-----	Coarse-loamy, mixed, superactive, mesic Typic Haplocalcids
Nalcasa-----	Siliceous, mesic Lithic Torripsamments
Navigon-----	Sandy-skeletal, siliceous, mesic Lithic Ustic Torriorthents
Needle-----	Mixed, mesic Lithic Torripsamments
Nepalto-----	Sandy-skeletal, mixed, mesic Typic Torriorthents
Nomrah-----	Fine-loamy, mixed, superactive, mesic Calcicidic Haplustalfs
Nonip-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Pagina-----	Coarse-loamy, mixed, superactive, mesic Typic Haplocalcids
Pariette family-----	Fine-loamy, mixed, superactive, mesic Typic Haplocalcids
Parkelei-----	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Parkwash-----	Mesic, coated Lithic Quartzipsamments
Peekaboo-----	Siliceous, mesic Typic Torripsamments
Pinepoint-----	Mesic, coated Ustic Quartzipsamments
Plumasano-----	Coarse-loamy, mixed, superactive, mesic Aridic Haplustepts
Podo-----	Loamy, mixed, superactive, frigid Aridic Lithic Haplustepts
Polychrome family-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Ustic Torriorthents
Progresso-----	Fine-loamy, mixed, superactive, mesic Ustic Calciargids
Quagmeier-----	Loamy-skeletal, mixed, superactive, mesic Calcicidic Haplustalfs
Radnik-----	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents
Ranion-----	Siliceous, mesic Typic Torripsamments
Reef-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Remorris-----	Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents
Retsabal-----	Loamy, gypsic, mesic, shallow Ustic Torriorthents
*Retsabal-----	Loamy, gypsic, mesic, shallow Ustic Torriorthents
Rizno-----	Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Robay-----	Sandy-skeletal, siliceous, frigid Lithic Ustorthents
Ruinpoint-----	Fine-silty, mixed, superactive, mesic Ustic Haplocambids
Ruko-----	Clayey, smectitic, frigid, shallow Aridic Haplustepts
Sanostee-----	Fine-loamy, mixed, superactive, mesic Ustic Calciargids
Santrick-----	Siliceous, mesic Ustic Torripsamments
Sazi-----	Coarse-loamy, mixed, superactive, mesic Ustic Haplocalcids

Table 11.--Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Seeg-----	Loamy-skeletal, mixed, superactive, mesic Typic Haplocalcids
Shalona-----	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Sheecal family-----	Loamy-skeletal, mixed, superactive, calcareous, frigid Aridic Ustorthents
Sheppard-----	Mixed, mesic Typic Torripsamments
Sili-----	Fine, smectitic, mesic Aridic Haplustepts
Simel-----	Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Skos-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Skyvillage-----	Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Sojourn family-----	Loamy, mixed, active, calcareous, mesic, shallow Aridic Ustorthents
Somorent-----	Loamy, mixed, superactive, calcareous, mesic, shallow Typic Torriorthents
Spooky-----	Siliceous, mesic Typic Torripsamments
Stent-----	Loamy-skeletal, mixed, superactive, mesic Typic Haplocalcids
Strell-----	Frigid, coated Lithic Quartzipsamments
Strych-----	Loamy-skeletal, mixed, superactive, mesic Ustic Haplocalcids
Suwanee-----	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents
Suzipon-----	Siliceous, mesic Lithic Torripsamments
Suzmayne-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Aridic Ustorthents
Tenneycanyon-----	Mesic, coated Lamellic Ustic Quartzipsamments
Timpoweap-----	Loamy-skeletal, mixed, superactive, mesic Lithic Haplustalfs
Trail-----	Sandy, mixed, mesic Typic Torrifluvents
Tsaya-----	Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Torriorthents
Upler-----	Loamy-skeletal, mixed, superactive, mesic Aridic Calciustepts
Vessilla-----	Loamy, mixed, active, calcareous, mesic Aridic Lithic Ustorthents
Wayneco-----	Loamy, mixed, superactive, mesic Lithic Ustic Haplocalcids
Widtsoe-----	Loamy-skeletal, mixed, superactive, frigid Calcic Argiustolls
Wiggler-----	Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
Winetti-----	Loamy-skeletal, mixed, superactive, calcareous, frigid Typic Ustifluvents
Yarts-----	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Yatne-----	Loamy-skeletal, mixed, superactive, mesic Aridic Calciustepts
Zibetod family-----	Loamy-skeletal, mixed, superactive, frigid Lithic Argiustolls
Zigzag-----	Clayey, smectitic, calcareous, mesic, shallow Aridic Ustorthents

# Appendix

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## The Soil Climate Model

Climatic Regime	Annual Precip. (in.)	Annual Precip. (mm.)	MAAT F.	MAAT C.	MAST F.	Frost-free period	Descriptor
Desert	6 to 9	152 to 229	52 to 57	11 to 14	54 to 59	160 to 190	Warm Mesic-Typic Aridic
Semidesert	9 to 12	229 to 305	45 to 52	7 to 11	47 to 54	120 to 160	Cool Mesic-Ustic Aridic
Upland (Mesic)	12 to 16	305 to 406	45 to 51	7 to 10.5	47 to 53	100 to 120	Cool Mesic-Aridic Ustic
Upland (Frigid)	12 to 16	305 to 406	42 to 45	5.6 to 7.2	44 to 47	70 to 90	Frigid-Aridic Ustic
Mountain	16 to 20	406 to 508	42 to 45	5.6 to 7.2	44 to 47	70 to 90	Frigid-Typic Ustic



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